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(FILE 'HOME' ENTERED AT 13:14:55 ON 16 DEC 2008)

L1 FILE 'LREGISTRY' ENTERED AT 13:15:07 ON 16 DEC 2008
STR

L2 FILE 'REGISTRY' ENTERED AT 13:18:41 ON 16 DEC 2008
0 SEA SSS SAM L1
D QUE STAT

L3 FILE 'REGISTRY' ENTERED AT 13:19:13 ON 16 DEC 2008
STR L1

L4 FILE 'REGISTRY' ENTERED AT 13:22:04 ON 16 DEC 2008
50 SEA SSS SAM L3
D QUE STAT
L5 SCR 2043

L6 FILE 'LREGISTRY' ENTERED AT 13:23:38 ON 16 DEC 2008
STR L3

L7 FILE 'REGISTRY' ENTERED AT 13:25:55 ON 16 DEC 2008
15 SEA SSS SAM L6

L8 FILE 'LREGISTRY' ENTERED AT 13:26:16 ON 16 DEC 2008
STR L6

L9 FILE 'REGISTRY' ENTERED AT 13:27:54 ON 16 DEC 2008
50 SEA SSS SAM L8

L10 FILE 'LREGISTRY' ENTERED AT 13:28:57 ON 16 DEC 2008
STR L8

L11 FILE 'REGISTRY' ENTERED AT 13:29:40 ON 16 DEC 2008
50 SEA SSS SAM L5 AND L10

L12 FILE 'HCAPLUS' ENTERED AT 13:31:06 ON 16 DEC 2008
1 SEA ABB=ON PLU=ON US20040197632/PN
D L12 ALL
SEL L12 RN

L13 FILE 'REGISTRY' ENTERED AT 13:31:41 ON 16 DEC 2008
8 SEA ABB=ON PLU=ON (690247-89-3/BI OR 122325-09-1/BI OR
663920-23-8/BI OR 663920-24-9/BI OR 690247-88-2/BI OR
7440-06-4/BI OR 7440-44-0/BI OR 9002-84-0/BI)

D SCA
 D QUE STAT
 D QUE STAT
 D QUE STAT L11
 D QUE STAT L11

L14 FILE 'LREGISTRY' ENTERED AT 13:36:52 ON 16 DEC 2008
 STR L10

L15 FILE 'REGISTRY' ENTERED AT 14:18:02 ON 16 DEC 2008
 50 SEA SSS SAM L14

D SAV
 DEL LEENEWPAR/A
 DEL AHZ303A/A
 L16 16442 SEA SSS FUL L14
 SAV TEMP L16 WEI394/A

FILE 'HCAPLUS' ENTERED AT 14:21:59 ON 16 DEC 2008
 L17 10598 SEA ABB=ON PLU=ON L16
 L18 243501 SEA ABB=ON PLU=ON BINDER OR BINDING# (2W) (AGENT#)
 L19 259 SEA ABB=ON PLU=ON L17 AND L18
 L20 39382 SEA ABB=ON PLU=ON (CARBON# OR C) (2A) (?PARTICLE? OR
 FLAKE# OR ?SPHERE?)
 L21 2 SEA ABB=ON PLU=ON L20 AND L19
 L22 915823 SEA ABB=ON PLU=ON MEMBRANE?
 L23 1295 SEA ABB=ON PLU=ON L17 AND L22
 L24 846378 SEA ABB=ON PLU=ON ?ELECTRODE?
 L25 13005 SEA ABB=ON PLU=ON (CATALYST? OR CAT#) (2A) (LAYER?)
 L26 1337 SEA ABB=ON PLU=ON L24 (2A) L25
 L27 755 SEA ABB=ON PLU=ON L22 AND L26
 D L27 1-16 KWIC
 D L27 1-3 HITSTR
 L28 19 SEA ABB=ON PLU=ON L17 AND L27
 L29 4 SEA ABB=ON PLU=ON L28 AND (L20 OR L18)

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 L30 6502 SEA ABB=ON PLU=ON MG(W)CM2
 L31 29986 SEA ABB=ON PLU=ON NOBLE? (2A) ?METAL?
 L32 1631643 SEA ABB=ON PLU=ON CAT# OR CATAL?

FILE 'REGISTRY' ENTERED AT 14:55:30 ON 16 DEC 2008
 L33 1 SEA ABB=ON PLU=ON 7440-06-4/RN
 E RHODIUM/CN
 L34 1 SEA ABB=ON PLU=ON RHODIUM/CN
 E RUTHENIUM/CN
 L35 1 SEA ABB=ON PLU=ON RUTHENIUM/CN

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      E PALLADIUM/CN
L36      1 SEA ABB=ON PLU=ON PALLADIUM/CN
      E GOLD/CN
L37      1 SEA ABB=ON PLU=ON GOLD/CN

FILE 'HCAPLUS' ENTERED AT 14:57:46 ON 16 DEC 2008
L38      164877 SEA ABB=ON PLU=ON ((L33 OR L34 OR L35 OR L36 OR L37)
      OR GOLD# OR AU# OR PD# OR PALLADIUM# OR PLATINUM# OR
      RHODIUM# OR RH# OR RUTHENIUM# OR RU#) (3A) (L32)
L39      5921 SEA ABB=ON PLU=ON L31 (2A) L32
L40      254 SEA ABB=ON PLU=ON L38 AND L30
L41      19 SEA ABB=ON PLU=ON L39 AND L30
      D L40 1-10 KWIC
L42      1183 SEA ABB=ON PLU=ON ("0.1" OR "0.2" OR "0.3" OR "0.4" OR
      "0.5" OR "0.6" OR "0.7" OR "0.8" OR "0.9" OR "1.0") (2A)
      (L30)
L43      4 SEA ABB=ON PLU=ON L42 AND L39
      D L43 1-4 KWIC
L44      87 SEA ABB=ON PLU=ON L38 AND L42
      D L44 1-4 KWIC
L45      0 SEA ABB=ON PLU=ON L17 AND (L43 OR L44)
L46      47 SEA ABB=ON PLU=ON (L40 OR L41) AND (CARBON# (W) BLACK#
      OR L20)
      D L46 1-8 KWIC
L47      11 SEA ABB=ON PLU=ON (L40 OR L41) AND (L20)
      SAV TEMP L17 WEI394B/A
L48      52689 SEA ABB=ON PLU=ON (100) (2A) (NM# OR NANOMET? OR
      NANO(W)MET?)
      D L48 1-13 KWIC
L49      163224 SEA ABB=ON PLU=ON (10 OR 20 OR 30 OR 40 OR 50 OR 60 OR
      70 OR 80 OR 90) (2A) (NM# OR NANOMET? OR NANO(W)MET?)
L50      287 SEA ABB=ON PLU=ON (L48 OR L49) (2A) (L20)
L51      0 SEA ABB=ON PLU=ON L17 AND L50
L52      39787 SEA ABB=ON PLU=ON ?DIFFUS? (2A) ?LAYER?
L53      1409 SEA ABB=ON PLU=ON L24 (2A) L52
L54      0 SEA ABB=ON PLU=ON L53 AND L17
L55      25 SEA ABB=ON PLU=ON L52 AND L17
      D L55 1-6 KWIC
L56      5 SEA ABB=ON PLU=ON L55 AND L26
      SAV TEMP L56 WEI394D/A
      D SAV
      SAV TEMP L41 WEI394E/A
      SAV TEMP L47 WEI394F/A
      D QUE STAT L16
      D L41 1-19 BIB ABS HITIND HITSTR
      D L47 1-11 BIB ABS HITIND HITSTR
      D L56 1-5 BIB ABS HITIND HITSTR

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          SAV TEMP L28 WEI394E/A
          D L28 HITSTR
L57      0 SEA ABB=ON  PLU=ON  (L40 OR L41) AND L17
L58      59 SEA ABB=ON  PLU=ON  (L38 OR L39) AND L17
L59      0 SEA ABB=ON  PLU=ON  L58 AND L42
L60      0 SEA ABB=ON  PLU=ON  L58 AND L30
          D L58 HITSTR
          D L58 1-3 KWIC
L61      2 SEA ABB=ON  PLU=ON  L58 AND L20
          D L61 1-2 KWIC
          D HITSTR L61
          SAV TEMP L61 WEI394F/A

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FILE HOME

FILE LREGISTRY

LREGISTRY IS A STATIC LEARNING FILE

NEW CAS INFORMATION USE POLICIES, ENTER HELP USAGETERMS FOR DETAILS.

FILE REGISTRY

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 15 DEC 2008 HIGHEST RN 1084993-68-9

DICTIONARY FILE UPDATES: 15 DEC 2008 HIGHEST RN 1084993-68-9

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH July 5, 2008.

Please note that search-term pricing does apply when conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/support/stngen/stndoc/properties.html>

FILE HCAPLUS

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FILE COVERS 1907 - 16 Dec 2008 VOL 149 ISS 25
FILE LAST UPDATED: 15 Dec 2008 (20081215/ED)

HCAplus now includes complete International Patent Classification (I) reclassification data for the third quarter of 2008.

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

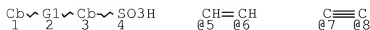
FILE LCA
LCA IS A STATIC LEARNING FILE

THIS FILE CONTAINS CAS REGISTRY NUMBERS FOR EASY AND ACCURATE SUBSTANCE IDENTIFICATION.

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d que stat l16
L14 STR



VAR G1=5-1 6-3/7-1 8-3/9/0/S

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 10

STEREO ATTRIBUTES: NONE

L16 16442 SEA FILE=REGISTRY SSS FUL L14

100.0% PROCESSED 494137 ITERATIONS

16442 ANSWERS

SEARCH TIME: 00.00.08

I

=> d 128 1-19 bib abs hitstr hitind

L28 ANSWER 1 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2008:1279124 HCAPLUS Full-text

DN 149:497033

TI membrane-electrode assembly, its manufacturing method, and
polymer electrolyte fuel cell

IN Matsumoto, Yuka; Shimoyama, Naoki; Kitai, Masayuki

PA Toray Industries, Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 16pp.

CODEN: JKXXAF

DT Patent
 LA Japanese
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2008258155	A	20081023	JP 2008-63826	20080313

PRAI JP 2007-64501 A 20070314

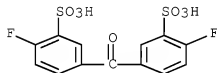
AB The invention relates to a membrane-electrode assembly of a polymer electrolyte fuel cell, comprising an anode electrode having a catalyst layer formed on an electrode substrate, the catalyst layer comprising metal particles, metal-supported particles, and polymer binders, wherein the weight ratio of the metal particle and the metal-supported particle to the polymer binder is 4/1 - 10/1, in order to enhance the catalytic reaction field.

IT 210531-45-6P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
 RACT (Reactant or reagent)
 (membrane-electrode assembly for polymer electrolyte fuel cell)

RN 210531-45-6 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt (1:2)
 (CA INDEX NAME)



● 2 Na

IT 962772-94-9DE, hydrolyzed

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (membrane-electrode assembly for polymer electrolyte fuel cell)

RN 862772-94-9 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt (1:2),

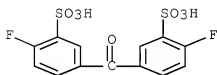
10/714,394

polymer with bis(4-fluorophenyl)methanone and
4,4'-(9H-fluoren-9-ylidene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 210531-45-6

CMF C13 H8 F2 O7 S2 . 2 Na

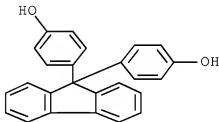


● 2 Na

CM 2

CRN 3236-71-3

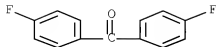
CMF C25 H18 O2



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST membrane electrode assembly polymer electrolyte fuel cell
 IT Fuel cell electrodes
 Fuel cells
 Membrane electrodes
 Polymer electrolytes
 (membrane-electrode assembly for polymer electrolyte
 fuel cell)
 IT Carbon fibers, uses
 Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (membrane-electrode assembly for polymer electrolyte
 fuel cell)
 IT 647838-24-2, Hispec 6000 1058165-28-8, Hispec 10000
 RL: CAT (Catalyst use); USES (Uses)
 (membrane-electrode assembly for polymer electrolyte
 fuel cell)
 IT 345-92-6, 4,4'-Difluorobenzophenone 8014-95-7, Fuming sulfuric
 acid
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (membrane-electrode assembly for polymer electrolyte
 fuel cell)
 IT 210531-45-6P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
 RACT (Reactant or reagent)
 (membrane-electrode assembly for polymer electrolyte
 fuel cell)
 IT 862772-94-9DP, hydrolyzed
 RL: SPN (Synthetic preparation); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (membrane-electrode assembly for polymer electrolyte
 fuel cell)

L28 ANSWER 2 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN
 AN 2008:887470 HCAPLUS [Full-text](#)
 DN 149:204439
 TI Electrolyte, membrane-electrode assembly (MEA), fuel cell
 unit cell, and the fuel cell
 IN Shiramizu, Kohei; Kodaira, Hideki
 PA Toppan Printing Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 36pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	JP 2008171663	A	20080724	JP 2007-3267	200701 11
PRAI	JP 2007-3267		20070111		
GI					

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

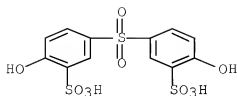
AB The electrolyte has a copolymer comprising a first carbon compound, a second carbon compound, and a third carbon compound; where the first carbon compound has a first structure comprising a proton acid group-containing aromatic ring and represented by I and/or II [V = Cl-6 alkylene group, 9,9-fluorenylidene group, -O-, -S-, -S(O)-, S(O)2-, -C(O)-, -P(O)(C6H5), -C(CH3)2-, -C(CF3)2-, C6H4-C6H4-, -C(C6H5)2-, or -C(=CH2); R = Cl-6 aliphatic group, Cl-6 alkoxy, Ph, phenoxy, nitro, cyano, H, Cl, Br, or I; X = proton acid obtained from SO3H, COOH, or PO3H2; m = integer 1-4; n = 1, 2]; the second carbon compound has a second structure comprising an heterocyclic ring and an aromatic ring and represented by III [Y = Cl-6 alkylene group, -O-, -NH-, -N(Q)-; U = Cl-6 alkylene group; Z = Cl-6 alkylene group, -O-, -S-, -S(O)-, S(O)2-, -C(O)-, -NH-, -N(Q)-; T = bond, phenylene; U = O, bond; Q = Cl-6 aliphatic group, Ph, nitro-Ph, alkoxy Ph, fluoro-Ph, chloro-Ph, bromo-Ph; iodo-Ph, cyano-Ph, aceto-Ph, OH, H, Cl, Br, and I] and the third carbon compound has a structure comprising an aromatic ring represented by I and/or II [n = 1-3, m = 0]. The membrane-electrode assembly has an electrode catalyst layer on both sides of a H+-conductive film which comprises the above electrolyte.

IT 53819-45-7

RL: RCT (Reactant); RACT (Reactant or reagent)
(comps. of polymer electrolytes in membrane-electrode
assemblies for fuel cells)

RN 53819-45-7 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-hydroxy-, sodium salt (1:2)
(CA INDEX NAME)



● 2 Na

IT 866552-08-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
 RACT (Reactant or reagent)

(comps. of polymer electrolytes in membrane-electrode
 assemblies for fuel cells)

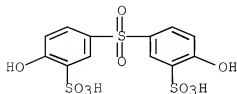
RN 866552-08-1 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-hydroxy-, sodium salt
 (1:2), polymer with 4,4'-oxybis[phenol] and
 1,1'-sulfonylbis[4-chlorobenzene] (CA INDEX NAME)

CM 1

CRN 53819-45-7

CMF C12 H10 O10 S3 . 2 Na

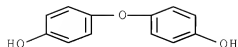


● 2 Na

CM 2

CRN 1965-09-9

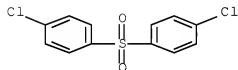
CMF C12 H10 O3



CM 3

CRN 80-07-9

CMF C12 H8 C12 O2 S



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- IT Fuel cell electrodes
 Fuel cell electrolytes
 Polymer electrolytes
 (compns. of polymer electrolytes in membrane-electrode
 assemblies for fuel cells)
- IT Glass fibers, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (compns. of polymer electrolytes in membrane-electrode
 assemblies for fuel cells)
- IT Carbon black, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (compns. of polymer electrolytes in membrane-electrode
 assemblies for fuel cells)
- IT Epoxy resins, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (compns. of polymer electrolytes in membrane-electrode
 assemblies for fuel cells)
- IT 1965-09-9, 4,4'-Dihydroxy diphenyl ether 2272-40-4
 RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation,
 nonpreparative); RACT (Reactant or reagent)
 (compns. of polymer electrolytes in membrane-electrode
 assemblies for fuel cells)

IT 62-53-3, Phenyl amine, reactions 80-07-9, Bis(4-chlorophenyl)
sulfone 108-67-8, Mesitylene, reactions 108-77-0,
2,4,6-Trichloro-1,3,5,-triazine 123-31-9, Hydroquinone, reactions
53819-45-7
RL: RCT (Reactant); RACT (Reactant or reagent)
(comps. of polymer electrolytes in membrane-electrode
assemblies for fuel cells)

IT 866552-08-1P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
RACT (Reactant or reagent)
(comps. of polymer electrolytes in membrane-electrode
assemblies for fuel cells)

IT 7440-06-4, Platinum, uses 7440-22-4, Silver, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(comps. of polymer electrolytes in membrane-electrode
assemblies for fuel cells)

L28 ANSWER 3 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2008:859827 HCAPLUS Full-text

DN 149:157223

TI Polymer electrolyte membrane/catalyst assembly (MEA), its
manufacture, and its hydrogen-fueled polymer electrolyte fuel cells
IN Kitamura, Kota; Sakaguchi, Yoshimitsu; Yamaguchi, Hiroki; Yamashita,
Masahiro; Yamada, Takatoshi; Takase, Satoshi; Miyagawa, Shinji
PA Toyobo Co., Ltd., Japan; Nissan Motor Co., Ltd.
SO Jpn. Kokai Tokkyo Koho, 16pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	JP 2008166050	A	20080717	JP 2006-352397	200612 27
PRAI	JP 2006-352397		20061227		
GI					

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB The MEA contains a polymer electrolyte membrane comprising (1) a
polymer represented by the general formula I [n1, n2, m1-m3 = ≥1-
integer satisfying n1/(n + n2) = 0.40-0.70, m3/(m1 + m2 + m3) =

0.005-0.05, and $m_2/(m_1 + m_2 + m_3) = 0.01-0.20$] and (2) 5-15% of a polymer II [$n_3 = \geq 1$ -integer; $m_4, m_5 = \geq 1$ -integer satisfying $m_5/(m_4 + m_5) = 0.60-0.80$] and an electrode catalyst layer which is bonded directly at least on one side of the polymer electrolyte membrane, where the surface roughness of the membrane/catalyst interface is $\leq 1 \mu\text{m}$. The MEA is prepared by direct application of a catalyst slurry containing an electrode catalyst, a polymer electrolyte and a solvent at least on one side of the polymer electrolyte membrane containing the polymer I and 5-15% of the polymer II in such a way that the surface roughness of the membrane /catalyst interface becomes $\leq 1 \mu\text{m}$. The hydrogen-fueled polymer electrolyte fuel cell shows high output performance even in low moisturizing condition and also shows excellent durability.

IT 1027300-88-4P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

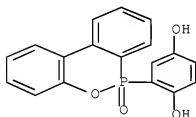
RN 1027300-88-4 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with 2,6-dichlorobenzonitrile, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 99208-50-1

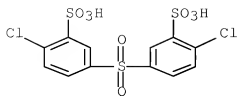
CMF C18 H13 O4 P



CM 2

CRN 51698-33-0

CMF C12 H8 C12 O8 S3 . 2 Na

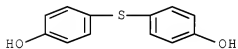


● 2 Na

CM 3

CRN 2664-63-3

CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

CMF C7 H3 Cl2 N



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST hydrogen fueled polymer electrolyte fuel cell; polymer electrolyte
 membrane electrode assembly

- IT Carbon black, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (Vulcan XC 72R, gas diffusion layer; manufacture of polymer
 electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
- IT Polyoxaalkylenes, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (fluorine- and sulfo-containing, ionomers, Nafion; manufacture of
 polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
- IT Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (manufacture of polymer electrolyte membrane/electrode
 assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT Polysulfones, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polybenzimidazole-; manufacture of polymer electrolyte
 membrane/electrode assembly for hydrogen-fueled polymer
 electrolyte fuel cells)
- IT Polythioethers
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polyether-polyoxyarylene-polysulfone-, cyano-containing;
 manufacture of
 polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
- IT Polysulfones, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polyether-polyoxyarylene-polythioether-, cyano-containing;
 manufacture of
 polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
- IT Polyoxarylenes
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polyether-polysulfone-polythioether-, cyano-containing;
 manufacture of
 polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
- IT Fuel cells
 (polymer electrolyte; polymer electrolyte membrane
 /electrode assembly (MEA), its manufacture, and its hydrogen-
 fueled
 polymer electrolyte fuel cells)

- IT Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylene-, sulfo-containing, ionomers, Nafion; manufacture
 of polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
- IT Ionomers
 RL: TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylenes, fluorine- and sulfo-containing, Nafion;
 manufacture of polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polyoxyarylene-polysulfone-polythioether-, cyano-containing;
 manufacture of polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
- IT Polybenzimidazoles
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polysulfone-; manufacture of polymer electrolyte membrane
 /electrode assembly for hydrogen-fueled polymer electrolyte fuel
 cells)
- IT 9002-84-0, Polyflon D 1E
 RL: TEM (Technical or engineered material use); USES (Uses)
 (carbon paper waterproofed with; manufacture of polymer
 electrolyte membrane/electrode assembly for hydrogen-fueled polymer
 electrolyte fuel cells)
- IT 354114-33-3, TGP-H 060
 RL: TEM (Technical or engineered material use); USES (Uses)
 (gas diffusion layer; manufacture of polymer electrolyte
 membrane/electrode assembly for hydrogen-fueled polymer
 electrolyte fuel cells)
- IT 861709-53-7P, 2,5-Dicarboxybenzenesulfonic acid monosodium
 salt-3,5-dicarboxyphenylphosphonic
 acid-3,3',4,4'-tetraaminodiphenylsulfone copolymer
 1027300-88-4P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (manufacture of polymer electrolyte membrane/electrode
 assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT 7440-06-4, Platinum, uses 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (platinum/carbon electrode catalyst)

layer; manufacture of polymer electrolyte membrane
/electrode assembly for hydrogen-fueled polymer electrolyte fuel
cells)

L28 ANSWER 4 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2008:859826 HCAPLUS Full-text

DN 149:180166

TI Polymer electrolyte membrane/catalyst assembly, its
manufacture, and hydrogen-fueled fuel cell

IN Yamashita, Masahiro; Kitamura, Kota; Yamaguchi, Hiroki; Yamada,
Takatoshi; Shimizu, Yusuke; Miyagawa, Shinji

PA Toyobo Co., Ltd., Japan; Nissan Motor Co., Ltd.

SO Jpn. Kokai Tokkyo Koho, 16pp.

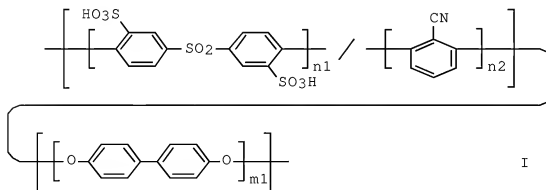
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	---	-----	-----	
PI	JP 2008166049	A	20080717	JP 2006-352389	200612 27
PRAI	JP 2006-352389		20061227		
GI					



AB The polymer electrolyte membrane/catalyst assembly contains (1) a
polymer electrolyte membrane which contains a polymer I (n1, n2 = ≥1-

integer satisfying $n1/(n1 + n2) = 0.40-0.70$; $m1 = \geq 1$ -integer) and shows coefficient of linear expansion at 150-200° (TGA, in N₃, 30-min dry at 25° followed by heating at 5°/min to 350°) in a predetd. range and (2) an electrode catalyst layer which is bonded directly on at least one side of the polymer electrolyte membrane and has been formed by direct application of a catalyst slurry containing Pt/C powder, ionomers, and solvent in such a way that the surface roughness of the membrane/catalyst interface becomes $\leq 1 \mu\text{m}$.

IT 681035-31-4P, 4,4'-Biphenol-2,6-dichlorobenzonitrile-3,3'-disulfo-4,4'-dichlorodiphenylsulfone disodium salt copolymer
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

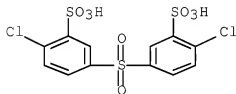
RN 681035-31-4 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol and 2,6-dichlorobenzonitrile (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 C12 O8 S3 . 2 Na



● 2 Na

CM 2

CRN 1194-65-6

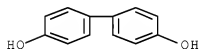
CMF C7 H3 C12 N



CM 3

CRN 92-88-6

CMF C12 H10 O2



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST polyarylene ether hydrogen fueled fuel cell; polymer electrolyte membrane catalyst assembly
- IT Carbon black, uses
- RL: TEM (Technical or engineered material use); USES (Uses)
(Vulcan XC 72R, gas diffusion layer; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT Polyoxyalkylenes, uses
- RL: TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, Nafion; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT Fluoropolymers, uses
- RL: TEM (Technical or engineered material use); USES (Uses)
(manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT Fuel cells
- (polymer electrolyte; polymer electrolyte membrane /electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)
- IT Fluoropolymers, uses

- RL: TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylene-, sulfo-containing, ionomers, Nafion; manufacture
 of
 polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
- IT Ionomers
 RL: TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylenes, fluorine- and sulfo-containing, Nafion;
 manufacture of
 polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
- IT Polysulfones, uses
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
 (Technical or engineered material use); PREP (Preparation); USES
 (Uses)
 (polyoxyphenylene-, oxynitrile-, sulfonic acid group-containing;
 polymer electrolyte membrane/electrode assembly (MEA),
 its manufacture, and its hydrogen-fueled polymer electrolyte fuel
 cells)
- IT Polyoxyphenylenes
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
 (Technical or engineered material use); PREP (Preparation); USES
 (Uses)
 (polysulfone-, oxynitrile-, sulfonic acid group-containing;
 polymer
 electrolyte membrane/electrode assembly (MEA), its
 manufacture, and its hydrogen-fueled polymer electrolyte fuel
 cells)
- IT 7440-06-4, Platinum, uses 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (Pt/carbon electrode catalyst layer
 ; manufacture of polymer electrolyte membrane/electrode
 assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT 9002-84-0, Polyflon D 1E
 RL: TEM (Technical or engineered material use); USES (Uses)
 (carbon paper water-proofed with; manufacture of polymer
 electrolyte
 membrane/electrode assembly for hydrogen-fueled polymer
 electrolyte fuel cells)
- IT 354114-33-3, TGP-H 060
 RL: TEM (Technical or engineered material use); USES (Uses)
 (gas diffusion layer; manufacture of polymer electrolyte
 membrane/electrode assembly for hydrogen-fueled polymer
 electrolyte fuel cells)
- IT 681035-31-4P, 4,4'-Biphenol-2,6-dichlorobenzonitrile-3,3'-
 disulfo-4,4'-dichlorodiphenylsulfone disodium salt copolymer
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM

(Technical or engineered material use); PREP (Preparation); USES (Uses)

(polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

L28 ANSWER 5 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2008:859823 HCAPLUS Full-text

DN 149:180165

TI Polymer electrolyte membrane/catalyst assembly, its manufacture, and hydrogen-fueled fuel cell

IN Sakaguchi, Yoshimitsu; Kitamura, Kota; Yamaguchi, Hiroki; Yamashita, Masahiro; Yamada, Takatoshi; Takase, Satoshi; Miyagawa, Shinji

PA Toyobo Co., Ltd., Japan; Nissan Motor Co., Ltd.

SO Jpn. Kokai Tokkyo Koho, 15pp.

CODEN: JKXXAF

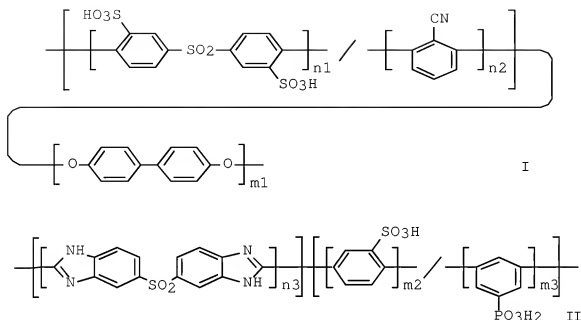
DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	

PI	JP 2008166037	A	20080717	JP 2006-352154	20061227
PRAI	JP 2006-352154		20061227		
GI					



AB The polymer electrolyte membrane/catalyst assembly contains (1) a polymer electrolyte membrane which is composed of 85-95% of a polymer I ($n_1, n_2 = \geq 1$ -integer satisfying $n_1/(n_1 + n_2) = 0.40-0.70$; $m_1 = \geq 1$ -integer) and 5-15% of a polymer II ($n_3 = \geq 1$ -integer; $m_2, m_3 = \geq 1$ -integer satisfying $m_3/(m_2 + m_3) = 0.60-0.80$) and (2) an electrode catalyst layer which is bonded directly on at least one side of the polymer electrolyte membrane and has been formed by direct application of a catalyst slurry containing electrode catalysts, polymer electrolytes, and solvents in such a way that the surface roughness of the membrane/catalyst interface becomes $\leq 1 \mu\text{m}$.

IT 681035-31-4P, 4,4'-Biphenol-2,6-dichlorobenzonitrile-3,3'-disulfo-4,4'-dichlorodiphenylsulfone disodium salt copolymer
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

RN 681035-31-4 HCAPLUS

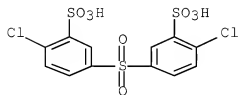
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol and 2,6-dichlorobenzonitrile (CA INDEX NAME)

10/714,394

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

CM 2

CRN 1194-65-6

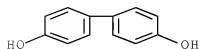
CMF C7 H3 Cl2 N



CM 3

CRN 92-88-6

CMF C12 H10 O2



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST hydrogen fueled fuel cell; polymer electrolyte membrane
 catalyst assembly
 IT Carbon black, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (Vulcan XC 72R, gas diffusion layer; manufacture of polymer
 electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
 IT Polyoxyalkylenes, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (fluorine- and sulfo-containing, ionomers, Nafion; manufacture of
 polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
 IT Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (manufacture of polymer electrolyte membrane/electrode
 assembly for hydrogen-fueled polymer electrolyte fuel cells)
 IT Polysulfones, uses
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
 (Technical or engineered material use); PREP (Preparation); USES
 (Uses)
 (polybenzimidazole-, sulfonic acid and phosphonic acid
 group-containing; polymer electrolyte membrane/electrode
 assembly (MEA), its manufacture, and its hydrogen-fueled polymer
 electrolyte fuel cells)
 IT Fuel cells
 (polymer electrolyte; polymer electrolyte membrane
 /electrode assembly (MEA), its manufacture, and its hydrogen-
 fueled polymer electrolyte fuel cells)
 IT Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylene-, sulfo-containing, ionomers, Nafion; manufacture
 of polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
 IT Ionomers
 RL: TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylenes, fluorine- and sulfo-containing, Nafion;
 manufacture of polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
 IT Polysulfones, uses
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM

(Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyoxyphenylene-, oxynitrile-, sulfonic acid group-containing; polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

IT Polyoxyphenylenes

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polysulfone-, oxynitrile-, sulfonic acid group-containing;

polymer

electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

IT Polybenzimidazoles

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polysulfone-, sulfonic acid and phosphonic acid group-containing; polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

IT 7440-06-4, Platinum, uses 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses)

(Pt/carbon electrode catalyst layer; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 9002-84-0, Polyflon D 1E

RL: TEM (Technical or engineered material use); USES (Uses) (carbon paper water-proofed with; manufacture of polymer

electrolyte

membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 354114-33-3, TGP-H 060

RL: TEM (Technical or engineered material use); USES (Uses) (gas diffusion layer; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 681035-31-4P, 4,4'-Biphenol-2,6-dichlorobenzonitrile-3,3'-disulfo-4,4'-dichlorodiphenylsulfone disodium salt copolymer 861709-53-7P, 2,5-Dicarboxybenzenesulfonic acid monosodium salt-3,5-dicarboxyphenylphosphonic acid-3,3',4,4'-tetraaminodiphenyl sulfone copolymer

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

L28 ANSWER 6 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2008:859822 HCAPLUS Full-text

DN 149:157283

TI Polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells
IN Kitamura, Kota; Sakaguchi, Yoshimitsu; Yamaguchi, Hiroki; Yamashita, Masahiro; Yamada, Takatoshi; Takase, Satoshi; Miyagawa, Shinji

PA Toyobo Co., Ltd., Japan; Nissan Motor Co., Ltd.

SO Jpn. Kokai Tokkyo Koho, 14pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	JP 2008166036	A	20080717	JP 2006-352148	200612 27
PRAI	JP 2006-352148		20061227		
GI					

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB The MEA contains a polymer electrolyte membrane comprising a polymer represented by the general formula I [$n_1, n_2, m_1-m_3 = \geq 1$ -integer satisfying $n_1/(n_1 + n_2) = 0.40-0.70$, $m_3/(m_1 + m_2 + m_3) = 0.005-0.05$, and $m_2/(m_1 + m_2 + m_3) = 0.01-0.20$] and an electrode catalyst layer which is bonded directly at least on one side of the polymer electrolyte membrane, where the surface roughness of the membrane/catalyst interface is $\leq 1 \mu\text{m}$. The MEA is prepared by direct application of a catalyst slurry containing an electrode catalyst, a polymer electrolyte and a solvent at least on one side of the polymer electrolyte membrane of a polymer I in such a way that the surface roughness of the membrane /catalyst interface becomes $\leq 1 \mu\text{m}$. The hydrogen-fueled polymer electrolyte fuel cell shows high output performance even in low moisturizing condition and also shows excellent durability.

IT 916849-47-3P

RL: IMF (Industrial manufacture); TEM (Technical or engineered

material use); PREP (Preparation); USES (Uses)

(manufacture of polymer electrolyte membrane/electrode

assembly for hydrogen-fueled polymer electrolyte fuel cells)

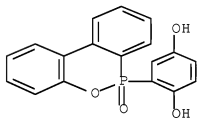
RN 916849-47-3 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 99208-50-1

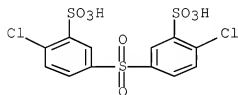
CMF C18 H13 O4 P



CM 2

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



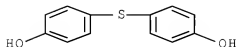
● 2 Na

10/714,394

CM 3

CRN 2664-63-3

CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

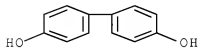
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

CMF C12 H10 O2



CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
ST hydrogen fueled polymer electrolyte fuel cell; polymer electrolyte
membrane electrode assembly
IT Carbon black, uses

- RL: TEM (Technical or engineered material use); USES (Uses)
 (Vulcan XC 72R, gas diffusion layer; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT Polyoxyalkylenes, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (fluorine- and sulfo-containing, ionomers; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT Polythioethers
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polyoxyarylene-polysulfone-, cyano-containing; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT Polysulfones, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polyoxyarylene-polythioether-, cyano-containing; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT Polyoxyarylenes
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polysulfone-polythioether-, cyano-containing; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT Fuel cells
 (polymer electrolyte; polymer electrolyte membrane /electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)
- IT Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylene-, sulfo-containing, ionomers; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)
- IT Ionomers
 RL: TEM (Technical or engineered material use); USES (Uses)

(polyoxyalkylenes, fluorine- and sulfo-containing; manufacture of polymer

electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT Polyethers, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyoxyarylene-polysulfone-polythioether-, cyano-containing; manufacture

of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 9002-84-0, Polyflon D 1E

RL: TEM (Technical or engineered material use); USES (Uses) (carbon paper waterproofed with; manufacture of polymer

electrolyte

membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 354114-33-3, TGP-H 060

RL: TEM (Technical or engineered material use); USES (Uses) (gas diffusion layer; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 916849-47-3P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 7440-06-4, Platinum, uses 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses) (platinum/carbon electrode catalyst layer; manufacture of polymer electrolyte membrane /electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

L28 ANSWER 7 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2008:608975 HCAPLUS Full-text

DN 148:565371

TI Sulfo-bearing branched polymers, compositions containing the polymers, polymer electrolytes made of the compositions, and membrane-electrode assemblies (MEA) for polymer-electrolyte fuel cells

IN Kitamura, Kota; Sakaguchi, Yoshimitsu; Yamaguchi, Hiroki; Yamashita, Masahiro; Sasai, Kosuke

PA Toyobo Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 34pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	JP 2008115340	A	20080522	JP 2006-302281	20061108
PRAI	JP 2006-302281		20061108		
GI					

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB The title polymers have structural units (I) [X = SO₂, CO; Y = H, monovalent cation; Z1-2 = O, S; Ar1 = p-C6H4Z3-p-C6H4; Z3 = O, S, C(Me)₂, etc.; Ar2 = p-C6H4SO₂-p-C6H4, p-C6H4CO-p-C6H4, etc.; Ar3 = p-C6H4SO₂-p-C6H4, etc.; n, m, o, p ≥ 1] and linking groups selected from Q1, Q2, etc., between I. Alternatively, structural units of the polymers are (II) [Ar4 = p-C6H4SO₂-p-C6H4, etc.; Ar5 = p-C6H4SO₂-p-C6H4, etc.; q ≥ 4; r, s ≥ 1]. Fuel cell membrane-electrode assemblies (MEA) contain title polymer composition in electrolyte membranes and/or electrode catalyst layers of polymer-electrolyte fuel cells. The MEA show small methanol permeation coefficient and achieve high energy output performance.

IT 1025740-05-9DP, protonated 1025740-06-0DP, protonated 1025740-07-1DP, protonated 1025740-08-2DP, protonated 1025740-09-3DP, protonated 1025740-10-6DP, protonated 1025740-11-7DP, protonated 1025740-12-8DP, protonated 1025740-13-9DP, protonated 1025740-14-0DP, protonated 1025740-15-1DP, protonated 1025740-16-2DP, protonated 1025740-17-3DP, protonated 1025740-18-4DP, protonated 1025740-19-5DP, protonated 1025740-20-8DP, protonated 1025740-21-9DP, protonated

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(sulfo-bearing branched polymers for membrane-electrode assemblies for polymer-electrolyte fuel cells)

RN 1025740-05-9 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 4,4',4''-ethylidynetris[phenol] and 4,4''-thiobis[phenol] (CA INDEX

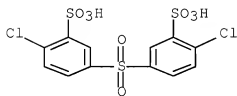
10/714,394

NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

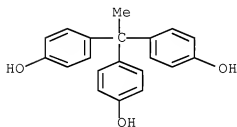


● 2 Na

CM 2

CRN 27955-94-8

CMF C20 H18 O3

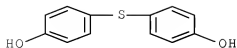


CM 3

CRN 2664-63-3

CMF C12 H10 O2 S

10/714,394



CM 4

CRN 1194-65-6

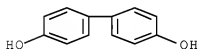
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

CMF C12 H10 O2



RN 1025740-06-0 HCAPLUS

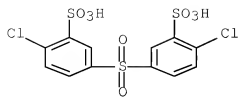
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 4,4'-thiobis[phenol] and 1,3,5-triazine-2,4,6(1H,3H,5H)-trione (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

10/714,394

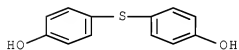


● 2 Na

CM 2

CRN 2664-63-3

CMF C12 H10 O2 S



CM 3

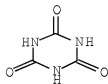
CRN 1194-65-6

CMF C7 H3 Cl2 N



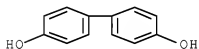
CM 4

CRN 108-80-5
CMF C3 H3 N3 O3



CM 5

CRN 92-88-6
CMF C12 H10 O2

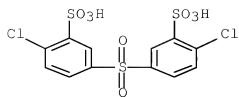


RN 1025740-07-1 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 4,4'-thiobis[phenol] and 1,3,5-triazine-2,4,6(1H,3H,5H)-trithione (CA INDEX NAME)

CM 1

CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na

10/714,394

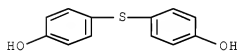


● 2 Na

CM 2

CRN 2664-63-3

CMF C12 H10 O2 S



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N

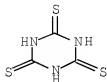


CM 4

CRN 638-16-4

10/714,394

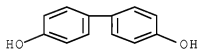
CMF C3 H3 N3 S3



CM 5

CRN 92-88-6

CMF C12 H10 O2



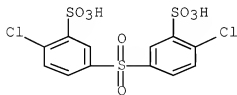
RN 1025740-08-2 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with 1,3,5-benzenetriol, [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

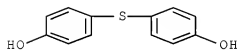


● 2 Na

CM 2

CRN 2664-63-3

CMF C12 H10 O2 S



CM 3

CRN 1194-65-6

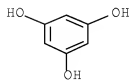
CMF C7 H3 Cl2 N



CM 4

CRN 108-73-6

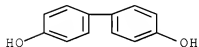
CMF C6 H6 O3



CM 5

CRN 92-88-6

CMF C12 H10 O2



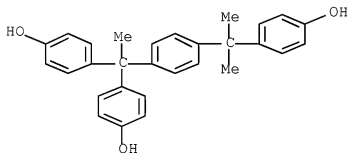
RN 1025740-09-3 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 4,4'-[1-[4-[1-(4-hydroxyphenyl)-1-methylethyl]phenyl]ethylidene]bis[phenol] and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 110726-28-8

CMF C29 H28 O3

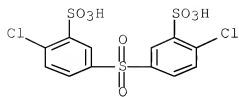


CM 2

CRN 51698-33-0

CMF C12 H8 C12 O8 S3 . 2 Na

10/714,394

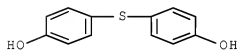


● 2 Na

CM 3

CRN 2664-63-3

CMF C12 H10 O2 S



CM 4

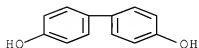
CRN 1194-65-6

CMF C7 H3 Cl2 N



CM 5

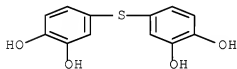
CRN 92-88-6
CMF C12 H10 O2



RN 1025740-10-6 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 4,4'-thiobis[1,2-benzenediol] and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

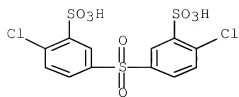
CRN 65201-00-5
CMF C12 H10 O4 S



CM 2

CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na

10/714,394

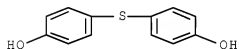


● 2 Na

CM 3

CRN 2664-63-3

CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

CMF C7 H3 Cl2 N

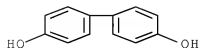


CM 5

CRN 92-88-6

10/714,394

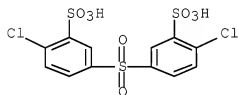
CMF C12 H10 O2



RN 1025740-11-7 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile,
4,4',4''-ethylidynetris[phenol] and 4,4'-oxybis[phenol] (CA INDEX
NAME)

CM 1

CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na

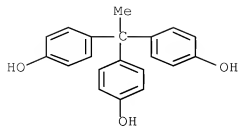


● 2 Na

CM 2

CRN 27955-94-8
CMF C20 H18 O3

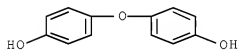
10/714,394



CM 3

CRN 1965-09-9

CMF C12 H10 O3



CM 4

CRN 1194-65-6

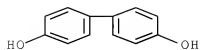
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

CMF C12 H10 O2

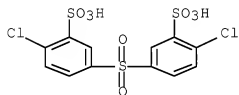


RN 1025740-12-8 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile,
 4,4',4''-ethylidynetris[phenol] and 4,4'-thiobis[benzenethiol] (CA
 INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



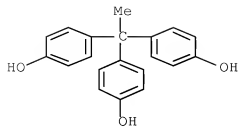
● 2 Na

CM 2

CRN 27955-94-8

CMF C20 H18 O3

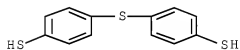
10/714,394



CM 3

CRN 19362-77-7

CMF C12 H10 S3



CM 4

CRN 1194-65-6

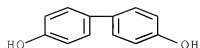
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

CMF C12 H10 O2

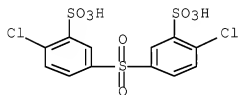


RN 1025740-13-9 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile,
 4,4',4''-ethylidynetris[phenol] and
 4,4'-(1-methylethylidene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



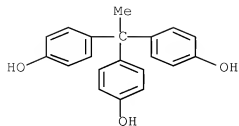
● 2 Na

CM 2

CRN 27955-94-8

CMF C20 H18 O3

10/714,394



CM 3

CRN 1194-65-6

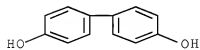
CMF C7 H3 C12 N



CM 4

CRN 92-88-6

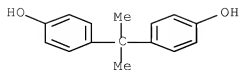
CMF C12 H10 O2



CM 5

CRN 80-05-7

CMF C15 H16 O2

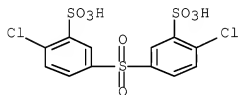


RN 1025740-14-0 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile,
 4,4',4''-ethylidynetris[phenol] and
 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA
 INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



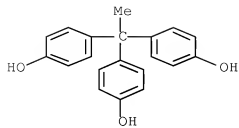
● 2 Na

CM 2

CRN 27955-94-8

CMF C20 H18 O3

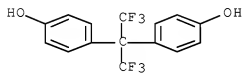
10/714,394



CM 3

CRN 1478-61-1

CMF C15 H10 F6 O2



CM 4

CRN 1194-65-6

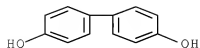
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

CMF C12 H10 O2

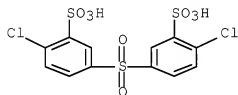


RN 1025740-15-1 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile,
 4,4',4''-ethylidynetris[phenol] and 4,4'-methylenebis[phenol] (CA
 INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



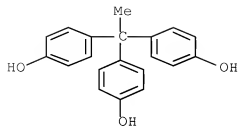
● 2 Na

CM 2

CRN 27955-94-8

CMF C20 H18 O3

10/714,394



CM 3

CRN 1194-65-6

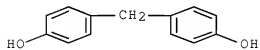
CMF C7 H3 C12 N



CM 4

CRN 620-92-8

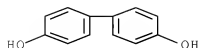
CMF C13 H12 O2



CM 5

CRN 92-88-6

CMF C12 H10 O2

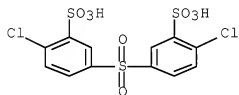


RN 1025740-16-2 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with [1,1'-biphenyl]-4,4'-diol,
 4,4'-cyclohexylidenebis[phenol], 2,6-dichlorobenzonitrile and
 4,4',4''-ethylidynetris[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



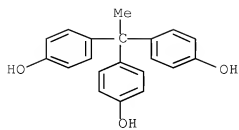
● 2 Na

CM 2

CRN 27955-94-8

CMF C20 H18 O3

10/714,394



CM 3

CRN 1194-65-6

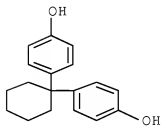
CMF C7 H3 C12 N



CM 4

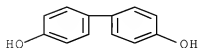
CRN 843-55-0

CMF C18 H20 O2



CM 5

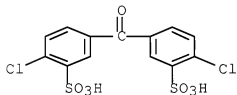
CRN 92-88-6
 CMF C12 H10 O2



RN 1025740-17-3 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-carbonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 4,4',4''-ethylidynetris[phenol] and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 57004-46-3
 CMF C13 H8 Cl2 O7 S2 . 2 Na

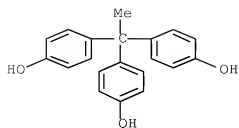


● 2 Na

CM 2

CRN 27955-94-8
 CMF C20 H18 O3

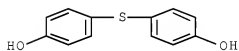
10/714,394



CM 3

CRN 2664-63-3

CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

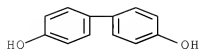
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

CMF C12 H10 O2

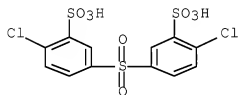


RN 1025740-18-4 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile,
 4,4',4''-ethylidynetris[phenol], 1,1'-sulfonylbis[4-chlorobenzene]
 and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



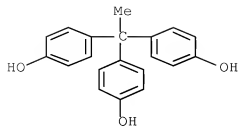
● 2 Na

CM 2

CRN 27955-94-8

CMF C20 H18 O3

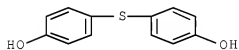
10/714,394



CM 3

CRN 2664-63-3

CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

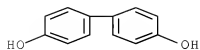
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

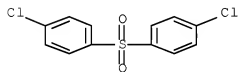
CMF C12 H10 O2



CM 6

CRN 80-07-9

CMF C12 H8 C12 O2 S



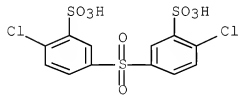
RN 1025740-19-5 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
polymer with [1,1'-biphenyl]-4,4'-diol,
bis(4-chlorophenyl)methanone, 2,6-dichlorobenzonitrile,
4,4',4''-ethylidynetris[phenol] and 4,4'-thiobis[phenol] (CA INDEX
NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 C12 O8 S3 . 2 Na



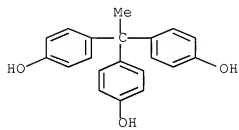
● 2 Na

10/714,394

CM 2

CRN 27955-94-8

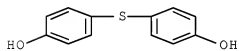
CMF C20 H18 O3



CM 3

CRN 2664-63-3

CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

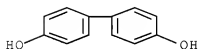
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

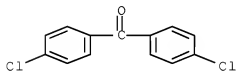
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CM 6

CRN 90-98-2

CMF C13 H8 Cl2 O



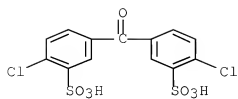
RN 1025740-20-8 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, bis(4-chlorophenyl)methanone, 2,6-dichlorobenzonitrile, 4,4',4'''-ethylidynetris[phenol] and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 57004-46-3

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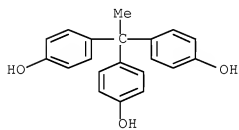


● 2 Na

CM 2

CRN 27955-94-8

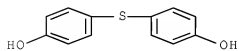
CMF C20 H18 O3



CM 3

CRN 2664-63-3

CMF C12 H10 O2 S



CM 4

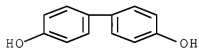
10/714,394

CRN 1194-65-6
CMF C7 H3 Cl2 N



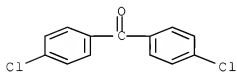
CM 5

CRN 92-88-6
CMF Cl2 H10 O2



CM 6

CRN 90-98-2
CMF Cl3 H8 Cl2 O



RN 1025740-21-9 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
polymer with 2,6-dichlorobenzonitrile,
4,4',4''-ethylidynetris[phenol] and 4,4'-oxybis[phenol] (CA INDEX

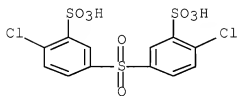
10/714,394

NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

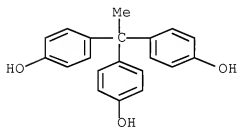


● 2 Na

CM 2

CRN 27955-94-8

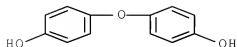
CMF C20 H18 O3



CM 3

CRN 1965-09-9

CMF C12 H10 O3



CM 4

CRN 1194-65-6

CMF C7 H3 Cl2 N



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

IT Polysulfones, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-, fluorine- and sulfo-containing; sulfo-bearing branched

polymers for membrane-electrode assemblies for
polymer-electrolyte fuel cells)

IT Polysulfones, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-, sulfo-containing, cardo; sulfo-bearing branched polymers

for membrane-electrode assemblies for
polymer-electrolyte fuel cells)

IT Polysulfones, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-, sulfo-containing; sulfo-bearing branched polymers for
membrane-electrode assemblies for polymer-electrolyte
fuel cells)

IT Polysulfides

RL: IMF (Industrial manufacture); TEM (Technical or engineered

- material use); PREP (Preparation); USES (Uses)
 (polyether-polyketone-, sulfo-containing; sulfo-bearing branched
 polymers for membrane-electrode assemblies for
 polymer-electrolyte fuel cells)
- IT Polysulfones, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polyether-polyketone-polysulfide-, sulfo-containing; sulfo-
 bearing
 branched polymers for membrane-electrode assemblies for
 polymer-electrolyte fuel cells)
- IT Polysulfides
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polyether-polyketone-polysulfone-, sulfo-containing; sulfo-
 bearing
 branched polymers for membrane-electrode assemblies for
 polymer-electrolyte fuel cells)
- IT Polyketones
 Polysulfones, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polyether-polysulfide-, sulfo-containing; sulfo-bearing branched
 polymers for membrane-electrode assemblies for
 polymer-electrolyte fuel cells)
- IT Polyketones
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polyether-polysulfide-polysulfone-, sulfo-containing; sulfo-
 bearing
 branched polymers for membrane-electrode assemblies for
 polymer-electrolyte fuel cells)
- IT Fluoropolymers, uses
 Polysulfides
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polyether-polysulfone-, sulfo-containing; sulfo-bearing branched
 polymers for membrane-electrode assemblies for
 polymer-electrolyte fuel cells)
- IT Cardo polymers
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polyether-polysulfones, sulfo-containing; sulfo-bearing branched
 polymers for membrane-electrode assemblies for
 polymer-electrolyte fuel cells)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered

- material use); PREP (Preparation); USES (Uses)
 (polyketone-polysulfide-, sulfo-containing; sulfo-bearing branched polymers for membrane-electrode assemblies for polymer-electrolyte fuel cells)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-polysulfide-polysulfone-, sulfo-containing; sulfo-bearing branched polymers for membrane-electrode assemblies for polymer-electrolyte fuel cells)
- IT Fuel cells
 (polymer electrolyte; sulfo-bearing branched polymers for membrane-electrode assemblies for polymer-electrolyte fuel cells)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polysulfide-polysulfone-, sulfo-containing; sulfo-bearing branched polymers for membrane-electrode assemblies for polymer-electrolyte fuel cells)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polysulfone-, fluorine- and sulfo-containing; sulfo-bearing branched polymers for membrane-electrode assemblies for polymer-electrolyte fuel cells)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polysulfone-, sulfo-containing; sulfo-bearing branched polymers for membrane-electrode assemblies for polymer-electrolyte fuel cells)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polysulfone-, sulfo-containing; sulfo-bearing branched polymers for membrane-electrode assemblies for polymer-electrolyte fuel cells)
- IT Fuel cell electrolytes
 (sulfo-bearing branched polymers for membrane-electrode assemblies for polymer-electrolyte fuel cells)
- IT 1025740-05-9DP, protonated 1025740-06-0DP, protonated 1025740-07-1DP, protonated

1025740-03-2DP, protonated 1025740-03-3DP,
 protonated 1025740-10-6DP, protonated
 1025740-11-7DP, protonated 1025740-12-8DP,
 protonated 1025740-13-9DP, protonated
 1025740-14-0DP, protonated 1025740-15-1DP,
 protonated 1025740-16-2DP, protonated
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 1025740-20-8DP, protonated 1025740-21-9DP,
 protonated

RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (sulfo-bearing branched polymers for membrane-electrode
 assemblies for polymer-electrolyte fuel cells)

L28 ANSWER 8 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2008:215436 HCAPLUS Full-text

DN 148:288489

TI Sulfo-containing photocrosslinkable polymers, their compositions,
 polymer electrolyte membranes, membrane
 /electrode assembly, and fuel cells

IN Kitamura, Kota; Sakaguchi, Yoshimitsu; Yamaguchi, Hiroki; Yamashita,
 Masahiro; Sasai, Kosuke

PA Toyobo Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 78pp.

CODEN: JKXXAF

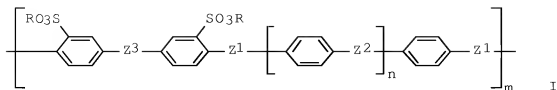
DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	JP 2008037897	A	20080221	JP 2006-210070	200608 01
PRAI	JP 2006-210070		20060801		
GI					



AB The sulfo-containing photocrosslinkable polymers have structural units of I and $[Ar1Z4(C6H4-p-Z5)nC6H4-p-Z3]m$ [$Z3 = SO_2, CO$; $R = H$, monovalent cation; $Z1, Z4 = O, S$; $Z2, Z5 = O, S, CMe_2, C(CF_3)_2, CH_2$, cyclohexyl; $Ar1 =$ divalent aromatic; $m =$ an integer; $n \geq 1$], photocrosslinkable groups, and softening temperature $\leq 250^\circ$ when $Y = H$. The comps. contain 1-100 weight% of the above polymers. Sulfo-containing crosslinked polymer comps. in which at least a part of the crosslinkable groups of the polymers is photocrosslinked are also claimed. Polymer electrolyte membranes made of the photocrosslinkable polymer comps. and crosslinked polymer electrolyte membranes made of the crosslinked polymer comps. are also claimed. The polymer electrolyte membrane /electrode assembly contains the (un)crosslinked polymer comps. in electrode catalyst layers or has the (un)crosslinked polymer membranes. The fuel cells use the membrane/electrode assembly. The polymer electrolyte membranes are manufactured by forming films of the photocrosslinkable polymer comps. and irradiating light to the films for photocrosslinking. The polymer electrolyte membranes show high proton conductivity and swelling resistance.

IT 916849-41-7DP, reaction products with chlorobenzophenone and dimethylphenol 1006382-68-8P 1006382-69-9P
1006382-70-2P 1006382-71-3P 1006382-72-4P
1006382-73-5P 1006382-74-6P 1006382-75-7P
1006382-76-8P 1006382-77-9P 1006382-78-0P
1006382-79-1P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(sulfo-containing photocrosslinkable polymers for polymer electrolyte membranes and membrane/electrode assembly in fuel cells)

RN 916849-41-7 HCAPLUS

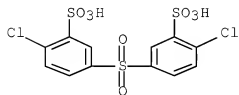
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile and 4,4'-thiobis[phenol] (CA INDEX NAME)

10/714,394

CM 1

CRN 51698-33-0

CMF C12 H8 C12 O8 S3 . 2 Na

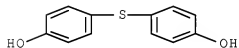


● 2 Na

CM 2

CRN 2664-63-3

CMF C12 H10 O2 S



CM 3

CRN 1194-65-6

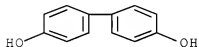
CMF C7 H3 Cl2 N



CM 4

CRN 92-88-6

CMF C12 H10 O2



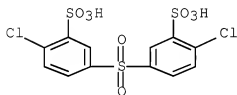
RN 1006382-68-8 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with bis(4-chlorophenyl)methanone, 2,6-dichlorobenzonitrile, 4,4'-(1-methylethylidene)bis[2-methylphenol] and 4,4'-oxybis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

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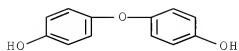


● 2 Na

CM 2

CRN 1965-09-9

CMF C12 H10 O3



CM 3

CRN 1194-65-6

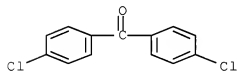
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CM 4

CRN 90-98-2

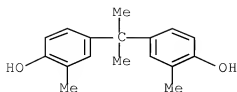
CMF C13 H8 C12 O



CM 5

CRN 79-97-0

CMF C17 H20 O2



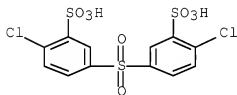
RN 1006382-69-9 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
polymer with bis(4-chlorophenyl)methanone, 2,6-dichlorobenzonitrile
and 4,4'-oxybis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

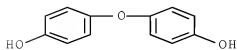


● 2 Na

CM 2

CRN 1965-09-9

CMF C12 H10 O3



CM 3

CRN 1194-65-6

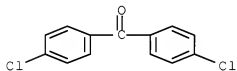
CMF C7 H3 Cl2 N



CM 4

CRN 90-98-2

CMF C13 H8 Cl2 O



RN 1006382-70-2 HCAPLUS

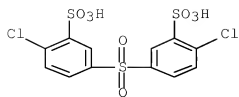
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with bis(4-chlorophenyl)methanone, 2,6-dichlorobenzonitrile, 4,4'-thiobis[2-methylphenol] and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

10/714,394

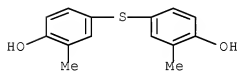


● 2 Na

CM 2

CRN 24197-34-0

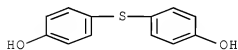
CMF C14 H14 O2 S



CM 3

CRN 2664-63-3

CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

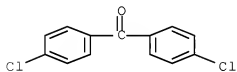
CMF C7 H3 Cl2 N



CM 5

CRN 90-98-2

CMF C13 H8 Cl2 O



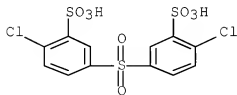
RN 1006382-71-3 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile,
2-methyl-1,4-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

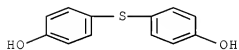
CMF C12 H8 Cl2 O8 S3 . 2 Na



CM 2

CRN 2664-63-3

CMF C12 H10 O2 S



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N



CM 4

CRN 95-71-6

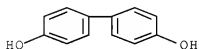
CMF C7 H8 O2



CM 5

CRN 92-88-6

CMF C12 H10 O2



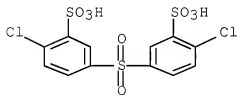
RN 1006382-72-4 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with [1,1'-biphenyl]-4,4'-diol,
 bis(4-chlorophenyl)methanone,
 4,4'-(1-methylethylidene)bis[2-methylphenol] and
 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



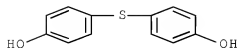
● 2 Na

CM 2

CRN 2664-63-3

10/714,394

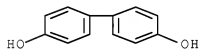
CMF C12 H10 O2 S



CM 3

CRN 92-88-6

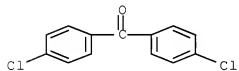
CMF C12 H10 O2



CM 4

CRN 90-98-2

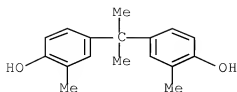
CMF C13 H8 Cl2 O



CM 5

CRN 79-97-0

CMF C17 H20 O2

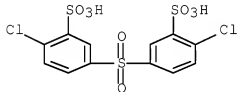


RN 1006382-73-5 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with [1,1'-biphenyl]-4,4'-diol,
 bis(4-chlorophenyl)methanone, 2,6-dichlorobenzonitrile,
 4,4'-(1-methylethylidene)bis[2-methylphenol] and
 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

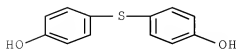


● 2 Na

CM 2

CRN 2664-63-3

CMF C12 H10 O2 S



CM 3

CRN 1194-65-6

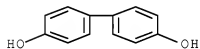
CMF C7 H3 Cl2 N



CM 4

CRN 92-88-6

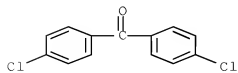
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CM 5

CRN 90-98-2

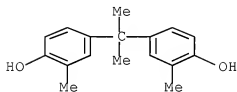
CMF C13 H8 Cl2 O



CM 6

CRN 79-97-0

CMF C17 H20 O2



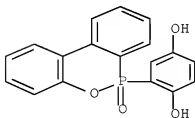
RN 1006382-74-6 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, bis(4-chlorophenyl)methanone, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol, 4,4'-thiobis[2-methylphenol] and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 99208-50-1

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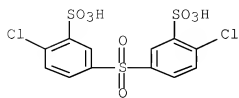


CM 2

CRN 51698-33-0

10/714,394

CMF C12 H8 Cl2 O8 S3 . 2 Na

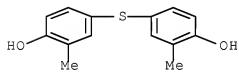


● 2 Na

CM 3

CRN 24197-34-0

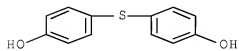
CMF C14 H14 O2 S



CM 4

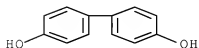
CRN 2664-63-3

CMF C12 H10 O2 S



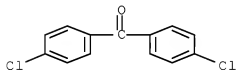
CM 5

CRN 92-88-6
 CMF C12 H10 O2



CM 6

CRN 90-98-2
 CMF C13 H8 Cl2 O

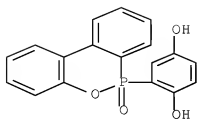


RN 1006382-75-7 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, bis(4-chlorophenyl)methanone, 2,6-dichlorobenzonitrile, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol, 4,4'-thiobis[2-methylphenol] and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 99208-50-1
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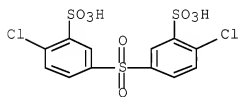
10/714,394



CM 2

CRN 51698-33-0

CMF C12 H8 C12 O8 S3 . 2 Na

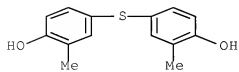


● 2 Na

CM 3

CRN 24197-34-0

CMF C14 H14 O2 S

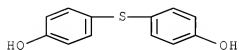


10/714,394

CM 4

CRN 2664-63-3

CMF C12 H10 O2 S



CM 5

CRN 1194-65-6

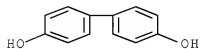
CMF C7 H3 Cl2 N



CM 6

CRN 92-88-6

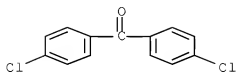
CMF C12 H10 O2



CM 7

CRN 90-98-2

CMF C13 H8 C12 O



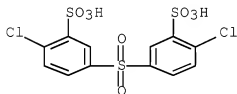
RN 1006382-76-8 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with [1,1'-biphenyl]-4,4'-diol,
 bis(4-chlorophenyl)methanone, 2,6-dichlorobenzonitrile,
 4,4'-thiobis[benzenethiol] and 4,4'-thiobis[2-methylphenol] (CA
 INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 C12 O8 S3 . 2 Na



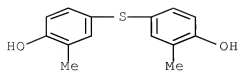
● 2 Na

CM 2

CRN 24197-34-0

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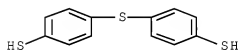
10/714,394



CM 3

CRN 19362-77-7

CMF C12 H10 S3



CM 4

CRN 1194-65-6

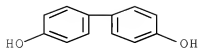
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

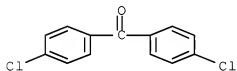
CMF C12 H10 O2



CM 6

CRN 90-98-2

CMF C13 H8 Cl2 O



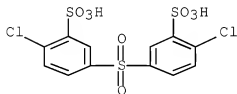
RN 1006382-77-9 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with [1,1'-biphenyl]-4,4'-diol,
 bis(4-chlorophenyl)methanone, 2,6-dichlorobenzonitrile,
 4,4'-(1-methylethylidene)bis[phenol] and
 4,4'-thiobis[2-methylphenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

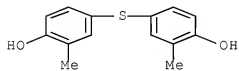


● 2 Na

CM 2

CRN 24197-34-0

CMF C14 H14 O2 S



CM 3

CRN 1194-65-6

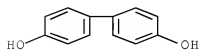
CMF C7 H3 Cl2 N



CM 4

CRN 92-88-6

CMF C12 H10 O2

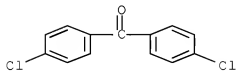


10/714,394

CM 5

CRN 90-98-2

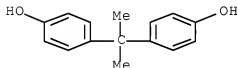
CMF C13 H8 C12 O



CM 6

CRN 80-05-7

CMF C15 H16 O2



RN 1006382-78-0 HCAPLUS

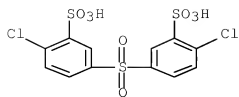
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, bis(4-chlorophenyl)methanone, 2,6-dichlorobenzonitrile, 4,4'-thiobis[2-methylphenol] and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 C12 O8 S3 . 2 Na

10/714,394

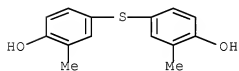


● 2 Na

CM 2

CRN 24197-34-0

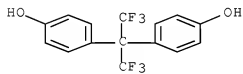
CMF C14 H14 O2 S



CM 3

CRN 1478-61-1

CMF C15 H10 F6 O2



CM 4

CRN 1194-65-6

10/714,394

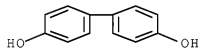
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

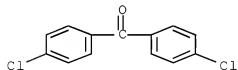
CMF C12 H10 O2



CM 6

CRN 90-98-2

CMF C13 H8 Cl2 O



RN 1006382-79-1 HCAPLUS

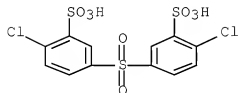
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
polymer with [1,1'-biphenyl]-4,4'-diol,
bis(4-chlorophenyl)methanone, 4,4'-cyclohexylidenebis[phenol],
2,6-dichlorobenzonitrile and 4,4'-thiobis[2-methylphenol] (CA INDEX
NAME)

10/714,394

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

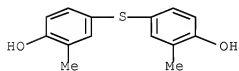


● 2 Na

CM 2

CRN 24197-34-0

CMF C14 H14 O2 S



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N

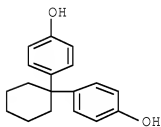
10/714,394



CM 4

CRN 843-55-0

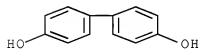
CMF C18 H20 O2



CM 5

CRN 92-88-6

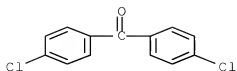
CMF C12 H10 O2



CM 6

CRN 90-98-2

CMF C13 H8 Cl2 O



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- ST sulfo photocrosslinkable polymer electrolyte membrane
electrode assembly fuel cell
- IT Crosslinking
(photochem.; sulfo-containing photocrosslinkable polymers for
polymer electrolyte membranes and membrane/electrode
assembly in fuel cells)
- IT Polythioethers
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polyether-polyketone-, sulfo-containing, heat-crosslinkable
group-introduced; sulfo-containing photocrosslinkable polymers for
polymer electrolyte membranes and membrane
/electrode assembly in fuel cells)
- IT Polysulfones, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polyether-polyketone-, sulfo-containing; sulfo-containing
photocrosslinkable polymers for polymer electrolyte
membranes and membrane/electrode assembly in
fuel cells)
- IT Polythioethers
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polyether-polyketone-polysulfone-, sulfo-containing,
heat-crosslinkable group-introduced; sulfo-containing
photocrosslinkable polymers for polymer electrolyte
membranes and membrane/electrode assembly in
fuel cells)
- IT Polysulfones, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polyether-polyketone-polythioether-, sulfo-containing,
heat-crosslinkable group-introduced; sulfo-containing
photocrosslinkable polymers for polymer electrolyte
membranes and membrane/electrode assembly in

- fuel cells)
- IT Polyketones
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polysulfone-, sulfo-containing; sulfo-containing photocrosslinkable polymers for polymer electrolyte membranes and membrane/electrode assembly in fuel cells)
- IT Polyketones
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polysulfone-polythioether-, sulfo-containing, heat-crosslinkable group-introduced; sulfo-containing photocrosslinkable polymers for polymer electrolyte membranes and membrane/electrode assembly in fuel cells)
- IT Polyketones
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polythioether-, sulfo-containing, heat-crosslinkable group-introduced; sulfo-containing photocrosslinkable polymers for polymer electrolyte membranes and membrane/electrode assembly in fuel cells)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-polysulfone-, sulfo-containing; sulfo-containing photocrosslinkable polymers for polymer electrolyte membranes and membrane/electrode assembly in fuel cells)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-polysulfone-polythioether-, sulfo-containing, heat-crosslinkable group-introduced; sulfo-containing photocrosslinkable polymers for polymer electrolyte membranes and membrane/electrode assembly in fuel cells)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-polythioether-, sulfo-containing, heat-crosslinkable group-introduced; sulfo-containing photocrosslinkable polymers for polymer electrolyte membranes and membrane/electrode assembly in fuel cells)
- IT Fuel cells
 (polymer electrolyte; sulfo-containing photocrosslinkable polymers

for polymer electrolyte membranes and membrane
/electrode assembly in fuel cells)

IT Ionic conductors
(protonic; sulfo-containing photocrosslinkable polymers for
polymer electrolyte membranes and membrane/electrode
assembly in fuel cells)

IT Fuel cell electrolytes
(sulfo-containing photocrosslinkable polymers for polymer
electrolyte membranes and membrane/electrode assembly in
fuel cells)

IT 95-65-8DP, 3,4-Dimethylphenol, reaction products with sulfo-
containing
polymers 134-85-0DP, 4-Chlorobenzophenone, reaction products with
sulfo-containing polymers 916849-41-7DP, reaction products
with chlorobenzophenone and dimethylphenol 1006382-63-8P
1006382-69-9P 1006382-70-2P 1006382-71-3P
1006382-72-4P 1006382-73-5P 1006382-74-6P
1006382-75-7P 1006382-76-8P 1006382-77-9P
1006382-78-0P 1006382-79-1P
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(sulfo-containing photocrosslinkable polymers for polymer
electrolyte membranes and membrane/electrode assembly in
fuel cells)

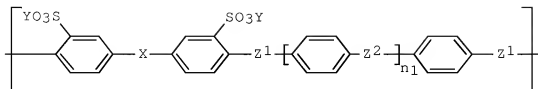
L28 ANSWER 9 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN
AN 2008:215423 HCAPLUS Full-text
DN 148:242902
TI Sulfo-containing heat-crosslinkable polymers, their compositions,
polymer electrolyte membranes, membrane
/electrode assembly, and fuel cells
IN Kitamura, Kota; Sakaguchi, Yoshimitsu; Yamaguchi, Hiroki; Yamashita,
Masahiro; Sasai, Kosuke
PA Toyobo Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 48pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	JP 2008037896	A	20080221	JP 2006-210069	200608

PRAI JP 2006-210069

20060801

GI



I

AB The sulfo-containing heat-crosslinkable polymers have structural units of I and $[Ar1Z3(C6H4-p-Z4)n2C6H4-p-Z3]$ [$X = S(:O)2, C(:O); Y = H, \text{monovalent cation}; Z1, Z3 = O, S; Z2, Z4 = O, S, CMe2, C(CF3)2, CH2, \text{cyclohexyl}; Ar1 = \text{divalent aromatic}; n1, n2 \geq 1]$], heat-crosslinkable groups, and softening temperature $\leq 250^\circ$ when $Y = H$. The comps. contain 1-100 weight% of the above polymers. Sulfo-containing crosslinked polymer comps. in which at least a part of the heat-crosslinkable groups of the polymers is heat-crosslinked are also claimed. Polymer electrolyte membranes made of the heat-crosslinkable polymer comps. and crosslinked polymer electrolyte membranes made of the crosslinked polymer comps. are also claimed. The polymer electrolyte membrane /electrode assembly contains the (un)crosslinked polymer comps. in electrode catalyst layers or has the (un)crosslinked polymer membranes. The fuel cells use the membrane/electrode assembly. The polymer electrolyte membranes show high proton conductivity and swelling resistance.

IT 916849-36-0DP, reaction products with chloropropyne
 916849-41-7DP, reaction products with ethynylphenol or
 hydroxystyrene 916849-42-8DP, reaction products with
 ethynylphenol 916849-43-9DP, reaction products with
 ethynylphenol 916849-44-0DP, reaction products with
 ethynylphenol 916849-45-1DP, reaction products with
 ethynylphenol 916849-47-3DP, reaction products with
 ethynylphenol

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(sulfo-containing heat-crosslinkable polymers for polymer electrolyte

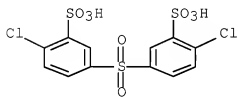
membranes and membrane/electrode assembly in fuel cells)

RN 916849-36-0 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with 2,6-dichlorobenzonitrile and 4,4'-oxybis[phenol] (CA
 INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

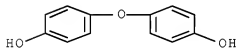


● 2 Na

CM 2

CRN 1965-09-9

CMF C12 H10 O3



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N

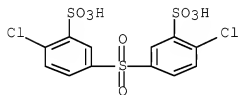


RN 916849-41-7 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

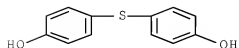


● 2 Na

CM 2

CRN 2664-63-3

CMF C12 H10 O2 S



CM 3

CRN 1194-65-6

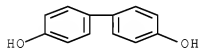
CMF C7 H3 Cl2 N



CM 4

CRN 92-88-6

CMF Cl2 H10 O2



RN 916849-42-8 HCAPLUS

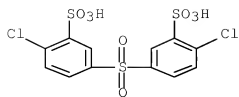
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile and 4,4'-thiobis[benzenethiol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF Cl2 H8 Cl2 O8 S3 . 2 Na

10/714,394

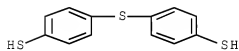


● 2 Na

CM 2

CRN 19362-77-7

CMF C12 H10 S3



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N

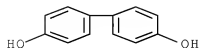


CM 4

CRN 92-88-6

10/714,394

CMF C12 H10 O2



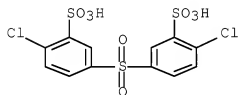
RN 916849-43-9 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile and 4,4'-(1-methylethylidene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

CM 2

CRN 1194-65-6

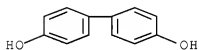
CMF C7 H3 Cl2 N



CM 3

CRN 92-88-6

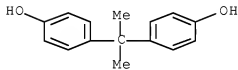
CMF C12 H10 O2



CM 4

CRN 80-05-7

CMF C15 H16 O2



RN 916849-44-0 HCAPLUS

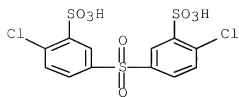
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

10/714,394

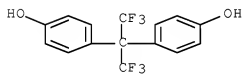


● 2 Na

CM 2

CRN 1478-61-1

CMF C15 H10 F6 O2



CM 3

CRN 1194-65-6

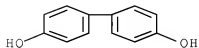
CMF C7 H3 Cl2 N



CM 4

10/714,394

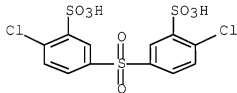
CRN 92-88-6
CMF C12 H10 O2



RN 916849-45-1 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
polymer with [1,1'-biphenyl]-4,4'-diol,
4,4'-cyclohexylidenebis[phenol] and 2,6-dichlorobenzonitrile (CA
INDEX NAME)

CM 1

CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

CM 2

CRN 1194-65-6
CMF C7 H3 Cl2 N

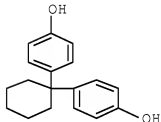
10/714,394



CM 3

CRN 843-55-0

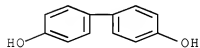
CMF C18 H20 O2



CM 4

CRN 92-88-6

CMF C12 H10 O2



RN 916849-47-3 HCAPLUS

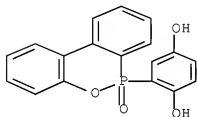
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

10/714,394

CM 1

CRN 99208-50-1

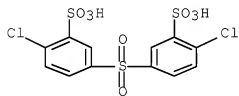
CMF C18 H13 O4 P



CM 2

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

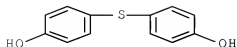


● 2 Na

CM 3

CRN 2664-63-3

CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

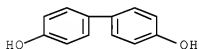
CMF C7 H3 C12 N



CM 5

CRN 92-88-6

CMF C12 H10 O2



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
- ST sulfo heat crosslinkable polymer electrolyte membrane
 electrode fuel cell
- IT Polysulfones, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (polyether-, sulfo-containing, heat-crosslinkable group-
 introduced;
 sulfo-containing heat-crosslinkable polymers for polymer

electrolyte

membranes and membrane/electrode assembly in
fuel cells)

IT Polythioethers

RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)

(polyether-polysulfone-, sulfo-containing, heat-crosslinkable
group-introduced; sulfo-containing heat-crosslinkable polymers for
polymer electrolyte membranes and membrane
/electrode assembly in fuel cells)

IT Polysulfones, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)

(polyether-polythioether-, sulfo-containing, heat-crosslinkable
group-introduced; sulfo-containing heat-crosslinkable polymers for
polymer electrolyte membranes and membrane
/electrode assembly in fuel cells)

IT Fuel cells

(polymer electrolyte; sulfo-containing heat-crosslinkable polymers
for polymer electrolyte membranes and membrane
/electrode assembly in fuel cells)

IT Polyethers, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)

(polysulfone-, sulfo-containing, heat-crosslinkable group-
introduced;
sulfo-containing heat-crosslinkable polymers for polymer
electrolyte

membranes and membrane/electrode assembly in
fuel cells)

IT Polyethers, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)

(polysulfone-polythioether-, sulfo-containing, heat-crosslinkable
group-introduced; sulfo-containing heat-crosslinkable polymers for
polymer electrolyte membranes and membrane
/electrode assembly in fuel cells)

IT Ionic conductors

(protonic; sulfo-containing heat-crosslinkable polymers for
polymer

electrolyte membranes and membrane/electrode
assembly in fuel cells)

IT Fuel cell electrolytes

(sulfo-containing heat-crosslinkable polymers for polymer
electrolyte

membranes and membrane/electrode assembly in
fuel cells)

IT Crosslinking
 (thermal; sulfo-containing heat-crosslinkable polymers for polymer electrolyte membranes and membrane/electrode assembly in fuel cells)

IT 624-65-7DP, 1-Chloro-2-propyne, reaction products with sulfo-containing polymers 2200-91-1DP, 4-Ethynylphenol, reaction products with sulfo-containing polymers 2628-17-3DP, 4-Hydroxystyrene, reaction products with sulfo-containing polymers 916849-36-0DP, reaction products with chloropropyne 916849-36-0DP, reaction products with ethynylphenol 916849-41-7DP, reaction products with ethynylphenol or hydroxystyrene 916849-42-8DP, reaction products with ethynylphenol 916849-43-9DP, reaction products with ethynylphenol 916849-44-0DP, reaction products with ethynylphenol 916849-45-1DP, reaction products with ethynylphenol 916849-47-3DP, reaction products with ethynylphenol

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(sulfo-containing heat-crosslinkable polymers for polymer electrolyte membranes and membrane/electrode assembly in fuel cells)

L28 ANSWER 10 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN
 AN 2008:90912 HCAPLUS Full-text
 DN 148:172159

TI Polymer electrolyte membrane, its manufacture, membrane-electrode assembly and fuel cell using the electrolyte membrane, and method for evaluating ion conductivity of polymer electrolyte membrane

IN Ishitobi, Masamitsu; Nodono, Mitsunori; Yamashita, Yasuhiro
 PA Sumitomo Chemical Company, Limited, Japan
 SO PCT Int. Appl., 43pp.
 CODEN: PIXXD2

DT Patent
 LA Japanese
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2008010605	A1	20080124	WO 2007-JP64623	

200707
 19

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS,

KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY,
 MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
 OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM,
 SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA,
 ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
 IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK,
 TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN,
 TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,
 ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

JP 2008066291 A 20080321 JP 2007-189777

200707
 20

PRAI JP 2006-198573 A 20060720
 JP 2006-215992 A 20060808

AB The polymer electrolyte membrane having a micro-phase separation structure, is manufactured by vapg. a solvent from a solution containing a polymer electrolyte having an ion conducting group; where in the evaporation step, time from the start to the completion of the evaporation of the solvent is limited to ≤60 min. The membrane -electrode assembly has the above polymer electrolyte membrane arranged between a pair of electrode catalyst layer. The fuel cell has the polymer electrolyte membrane between a cathode and an anode. A method for valuating ion conductivity of the polymer electrolyte membrane is also disclosed.

IT 1002110-12-4P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (manufacture of polymer electrolyte membranes in membrane-electrode assemblies for fuel cells)

RN 1002110-12-4 HCAPLUS

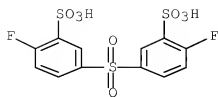
CN Benzenesulfonic acid, 2,5-dihydroxy-, potassium salt (1:1), polymer with potassium 3,3'-sulfonylbis[6-fluorobenzenesulfonate] (2:1), 1,1'-sulfonylbis[4-fluorobenzene] and 4,4'-sulfonylbis[phenol] (CA INDEX NAME)

CM 1

CRN 816417-98-8

CMF C12 H8 F2 O8 S3 . 2 K

10/714,394

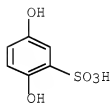


● 2 K

CM 2

CRN 21799-87-1

CMF C6 H6 O5 S . K

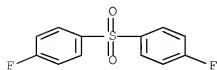


● K

CM 3

CRN 383-29-9

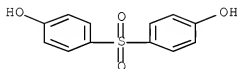
CMF C12 H8 F2 O2 S



CM 4

CRN 80-09-1

CMF C12 H10 O4 S

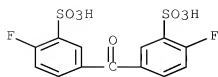


CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST polymer electrolyte membrane electrode assembly fuel cell;
 ion cond evaluation polymer electrolyte membrane fuel cell
 IT Fuel cell electrodes
 Fuel cell electrolytes
 Fuel cells
 Polymer electrolytes
 (manufacture of polymer electrolyte membranes in
 membrane-electrode assemblies for fuel cells)
 IT 1002110-12-4P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (manufacture of polymer electrolyte membranes in
 membrane-electrode assemblies for fuel cells)
 IT 67-68-5, Dimethyl sulfoxide, processes
 RL: PEP (Physical, engineering or chemical process); REM (Removal or
 disposal); PROC (Process)
 (manufacture of polymer electrolyte membranes in
 membrane-electrode assemblies for fuel cells)
 RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT
 L28 ANSWER 11 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN
 AN 2007:618693 HCAPLUS Full-text
 DN 147:34462
 TI Membrane electrode assemblies, polymer electrolyte fuel
 cells, and their manufacture, and portable electronic appliances
 IN Uete, Takao; Shimoyama, Naoki; Adachi, Shinya
 PA Toray Industries, Inc., Japan
 SO Jpn. Kokai Tokkyo Koho, 28pp.
 CODEN: JKXXAF

DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2007141832	A	20070607	JP 2006-287208	20061023
PRAI	JP 2005-306584	A	20051021		
AB	<p>The title membrane electrode assembly (MEA) is equipped with an ionic group-containing hydrocarbon-type polymer film between the electrolyte membrane and each electrode catalyst layer, where ≥ 1 of the polymer films have larger area than their neighboring electrode catalyst layer. The MEA is manufactured by forming an ionic group-containing hydrocarbon-type polymer film containing a plasticizer on an anode and/or cathode catalyst layers and/or an electrolyte membrane; bonding the integrated polymer with an electrolyte membrane and/or electrode catalyst layer which may have the polymer film; and then removing the plasticizer from the film. The fuel cell, especially, direct methanol fuel cells, equipped with the MEA provides high performance for long time.</p>				
IT	<p>938169-85-8DP, proton exchanged RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (manufacture of membrane electrode assemblies and polymer electrolyte fuel cells for portable electronic appliances)</p>				
RN	938169-85-8 HCAPLUS				
CN	<p>Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt (1:2), polymer with bis(4-fluorophenyl)methanone, 4,4'-(9H-fluoren-9-ylidene)bis[phenol] and potassium carbonate (2:1) (CA INDEX NAME)</p>				
CM	1				
CRN	210531-45-6				
CMF	C13 H8 F2 O7 S2 . 2 Na				

10/714,394

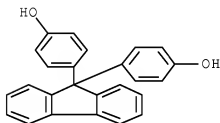


● 2 Na

CM 2

CRN 3236-71-3

CMF C25 H18 O2



CM 3

CRN 584-08-7

CMF C H2 O3 . 2 K

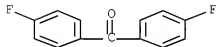


● 2 K

CM 4

CRN 345-92-6

CMF C13 H8 F2 O



IT 210531-45-6P, Disodium

3,3'-disulfonate-4,4'-difluorobenzophenone

RL: IMF (Industrial manufacture); RCT (Reactant); PREP

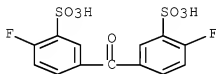
(Preparation); RACT (Reactant or reagent)

(preparation and polymerization of; manufacture of membrane electrode

assemblies and polymer electrolyte fuel cells for portable electronic appliances)

RN 210531-45-6 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt (1:2) (CA INDEX NAME)



● 2 Na

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 38, 76

ST hydrocarbon ionic polymer membrane electrode assembly fuel cell

IT Polyethers, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(fluorine- and sulfo-containing, ionomers; manufacture of membrane

- electrode assemblies and polymer electrolyte fuel cells for portable electronic appliances)
- IT Electric apparatus
(manufacture of membrane electrode assemblies and polymer electrolyte fuel cells for portable electronic appliances)
- IT Polyketones
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, aromatic, fluorine-containing, cardo, sulfo-containing; manufacture of membrane electrode assemblies and polymer electrolyte fuel cells for portable electronic appliances)
- IT Fluoropolymers, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, sulfo-containing, ionomers; manufacture of membrane electrode assemblies and polymer electrolyte fuel cells for portable electronic appliances)
- IT Fluoropolymers, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyketone-, aromatic, cardo, sulfo-containing; manufacture of membrane electrode assemblies and polymer electrolyte fuel cells for portable electronic appliances)
- IT Cardo polymers
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyketones, aromatic, fluorine-containing, sulfo-containing; manufacture of membrane electrode assemblies and polymer electrolyte fuel cells for portable electronic appliances)
- IT Polyethers, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, aromatic, fluorine-containing, cardo, sulfo-containing; manufacture of membrane electrode assemblies and polymer electrolyte fuel cells for portable electronic appliances)
- IT Fuel cells
(polymer electrolyte, direct methanol; manufacture of membrane electrode assemblies and polymer electrolyte fuel cells for portable electronic appliances)
- IT 938169-85-8DE, proton exchanged
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manufacture of membrane electrode assemblies and polymer

IT electrolyte fuel cells for portable electronic appliances)
 56-81-5, Glycerin, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (plasticizer; manufacture of membrane electrode assemblies
 and polymer electrolyte fuel cells for portable electronic
 appliances)

IT 210531-45-6P, Disodium
 3,3'-disulfonate-4,4'-difluorobenzophenone
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP
 (Preparation); RACT (Reactant or reagent)
 (preparation and polymerization of; manufacture of membrane
 electrode
 assemblies and polymer electrolyte fuel cells for portable
 electronic appliances)

IT 345-92-6, 4,4'-Difluorobenzophenone
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reaction of; manufacture of membrane electrode assemblies
 and polymer electrolyte fuel cells for portable electronic
 appliances)

L28 ANSWER 12 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2007:328323 HCAPLUS Full-text

DN 146:362055

TI Membrane-electrode assembly, polymer electrolyte fuel
 cell, and their manufacture

IN Shimoyama, Naoki; Uete, Takao; Kono, Satoshi; Adachi, Masaya;
 Miyawaki, Hisao

PA Toray Industries, Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 26pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	

PI	JP 2007073324	A	20070322	JP 2005-258859	

200509
07

PRAI JP 2005-258859 20050907

AB The membrane-electrode assembly has an anode, a cathode, an
 electrolyte membrane, and a hydrocarbon based polymer coating film
 between the electrode and the electrolyte membrane; where the
 thickness of the hydrocarbon based polymer coating film on the anode
 side is larger than that on the cathode side. The membrane-electrode
 assembly is manufactured by arranging a plasticizer-containing
 hydrocarbon based polymer on an electrode catalyst layer, sticking

the hydrocarbon based polymer film with the electrolyte membrane , and removing the plasticizer. The fuel cell is constituted by using the above membrane-electrode assembly.

IT 862772-94-9 862773-00-0

RL: MOA (Modifier or additive use); USES (Uses)

(structure and manufacture of membrane-electrode assemblies containing hydrocarbon based polymer films between electrodes and electrolyte membranes for polymer electrolyte fuel cells)

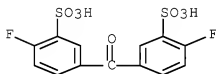
RN 862772-94-9 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt (1:2), polymer with bis(4-fluorophenyl)methanone and 4,4'-(9H-fluoren-9-ylidene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 210531-45-6

CMF C13 H8 F2 O7 S2 . 2 Na

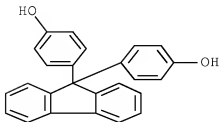


●2 Na

CM 2

CRN 3236-71-3

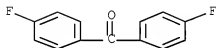
CMF C25 H18 O2



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



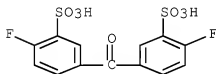
RN 862773-00-0 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt (1:2),
polymer with bis(4-fluorophenyl)methanone and
4,4'-(diphenylmethylene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 210531-45-6

CMF C13 H8 F2 O7 S2 . 2 Na

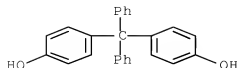


● 2 Na

CM 2

CRN 1844-01-5

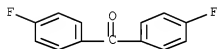
CMF C25 H20 O2



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST fuel cell membrane electrode assembly manuf hydrocarbon
polymer coating
- IT Polyoxyalkylenes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; structure and
manufacture of
membrane-electrode assemblies containing hydrocarbon based
polymer films between electrodes and electrolyte
membranes for polymer electrolyte fuel cells)
- IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; structure and
manufacture
of membrane-electrode assemblies containing hydrocarbon
based polymer films between electrodes and electrolyte
membranes for polymer electrolyte fuel cells)
- IT Ionomers
RL: TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; structure and
manufacture of membrane-electrode assemblies containing
hydrocarbon based polymer films between electrodes and
electrolyte membranes for polymer electrolyte fuel
cells)
- IT Fuel cell electrodes

Fuel cell electrolytes

Fuel cells

(structure and manufacture of membrane-electrode assemblies containing hydrocarbon based polymer films between electrodes and electrolyte membranes for polymer electrolyte fuel cells)

IT Carbon fibers, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(structure and manufacture of membrane-electrode assemblies containing hydrocarbon based polymer films between electrodes and electrolyte membranes for polymer electrolyte fuel cells)

IT 7440-06-4, Platinum, uses 12779-05-4

RL: CAT (Catalyst use); USES (Uses)

(structure and manufacture of membrane-electrode assemblies containing hydrocarbon based polymer films between electrodes and electrolyte membranes for polymer electrolyte fuel cells)

IT 862772-94-9 862773-00-0

RL: MOA (Modifier or additive use); USES (Uses)

(structure and manufacture of membrane-electrode assemblies containing hydrocarbon based polymer films between electrodes and electrolyte membranes for polymer electrolyte fuel cells)

L28 ANSWER 13 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2007:284308 HCAPLUS Full-text

DN 146:320203

TI Membrane-electrode assemblies containing antioxidants and light stabilizers, and fuel cells using them

IN Kitamura, Kota; Sakaguchi, Yoshimitsu; Yamashita, Masahiro

PA Toyobo Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 53pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	---	-----	-----	
PI	JP 2007066882	A	20070315	JP 2006-187809	200607 07
PRAI	JP 2005-223992	A	20050802		
AB	The assemblies comprise proton-conductive hydrocarbon polymer membranes containing phosphite antioxidants, thioether antioxidants, and/or hindered amine light stabilizers, and electrode catalyst				

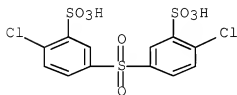
layers containing phenolic antioxidants. Preferably, the membranes sulfo-containing aromatic polysulfones, aromatic polyether-polysulfones, etc.

- IT 267877-35-0DP, hydrolyzed 627538-51-6DP,
hydrolyzed 681035-31-4DP,
4,4'-Biphenol-2,6-dichlorobenzonitrile-disodium
4,4'-dichloro-3,3'-disulfodiphenyl sulfone copolymer, hydrolyzed
681035-35-8DP, hydrolyzed 681035-36-9DP,
hydrolyzed 864062-86-2DP, hydrolyzed 916849-36-0DP
, hydrolyzed 916849-42-3DP, hydrolyzed
916849-45-1DP, hydrolyzed 929035-11-0DP,
hydrolyzed 929035-12-1DP, hydrolyzed 929035-13-2DP
, hydrolyzed 929035-14-3DP, hydrolyzed
929035-15-4DP, hydrolyzed
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
(Technical or engineered material use); PREP (Preparation); USES
(Uses)
(membrane-electrode assemblies containing antioxidants and
light stabilizers for polymer electrolyte fuel cells)
- RN 267877-35-0 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
polymer with [1,1'-biphenyl]-4,4'-diol and
1,1'-sulfonylbis[4-chlorobenzene] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 C12 O8 S3 . 2 Na



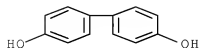
● 2 Na

CM 2

CRN 92-88-6

10/714,394

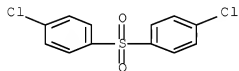
CMF C12 H10 O2



CM 3

CRN 80-07-9

CMF C12 H8 Cl2 O2 S



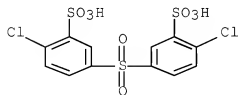
RN 627538-51-6 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with 2,6-dichlorobenzonitrile and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

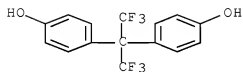


● 2 Na

CM 2

CRN 1478-61-1

CMF C15 H10 F6 O2



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N



RN 681035-31-4 HCAPLUS

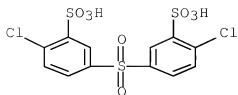
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol and 2,6-dichlorobenzonitrile (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

10/714,394



● 2 Na

CM 2

CRN 1194-65-6

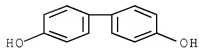
CMF C7 H3 Cl2 N



CM 3

CRN 92-88-6

CMF C12 H10 O2



RN 681035-35-8 HCAPLUS

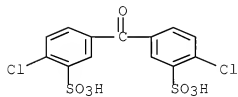
CN Benzenesulfonic acid, 3,3'-carbonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol and 2,6-dichlorobenzonitrile (CA INDEX NAME)

10/714,394

CM 1

CRN 57004-46-3

CMF C13 H8 Cl2 O7 S2 . 2 Na



● 2 Na

CM 2

CRN 1194-65-6

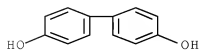
CMF C7 H3 Cl2 N



CM 3

CRN 92-88-6

CMF C12 H10 O2

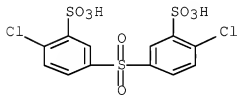


RN 681035-36-9 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with 2,6-dichlorobenzonitrile and
 4,4'-(1-methylethylidene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

CM 2

CRN 1194-65-6

CMF C7 H3 Cl2 N

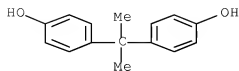


CM 3

CRN 80-05-7

10/714,394

CMF C15 H16 O2



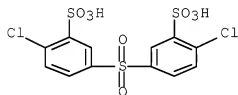
RN 864062-86-2 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with 2,6-dichlorobenzonitrile and 4,4'-(9H-fluoren-9-ylidene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

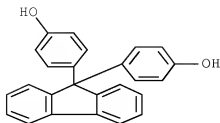


● 2 Na

CM 2

CRN 3236-71-3

CMF C25 H18 O2



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N



RN 916849-36-0 HCAPLUS

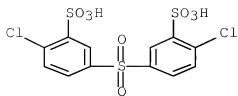
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
polymer with 2,6-dichlorobenzonitrile and 4,4'-oxybis[phenol] (CA
INDEX NAME)

CM 1

CRN 51698-33-0

CMF Cl2 H8 Cl2 O8 S3 . 2 Na

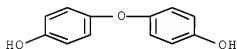
10/714,394



CM 2

CRN 1965-09-9

CMF C12 H10 O3



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N



RN 916849-42-8 HCAPLUS

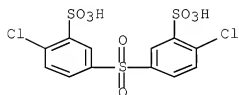
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile and 4,4'-thiobis[benzenethiol] (CA INDEX NAME)

10/714,394

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

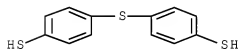


● 2 Na

CM 2

CRN 19362-77-7

CMF C12 H10 S3



CM 3

CRN 1194-65-6

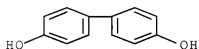
CMF C7 H3 Cl2 N



CM 4

CRN 92-88-6

CMF C12 H10 O2



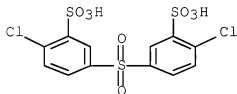
RN 916849-45-1 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
polymer with [1,1'-biphenyl]-4,4'-diol,
4,4'-cyclohexylidenebis[phenol] and 2,6-dichlorobenzonitrile (CA
INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

CM 2

CRN 1194-65-6

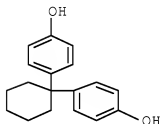
CMF C7 H3 Cl2 N



CM 3

CRN 843-55-0

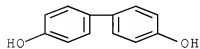
CMF C18 H20 O2



CM 4

CRN 92-88-6

CMF C12 H10 O2



RN 929035-11-0 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol

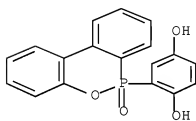
10/714,394

and 4,4'-sulfonylbis[phenol] (CA INDEX NAME)

CM 1

CRN 99208-50-1

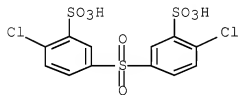
CMF C18 H13 O4 P



CM 2

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

CM 3

CRN 1194-65-6

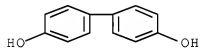
CMF C7 H3 Cl2 N



CM 4

CRN 92-88-6

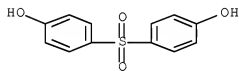
CMF C12 H10 O2



CM 5

CRN 80-09-1

CMF C12 H10 O4 S



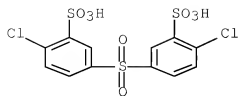
RN 929035-12-1 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
polymer with 2,6-dichlorobenzonitrile and 4,4'-sulfonylbis[phenol]
(CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

CM 2

CRN 1194-65-6

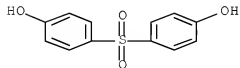
CMF C7 H3 Cl2 N



CM 3

CRN 80-09-1

CMF C12 H10 O4 S



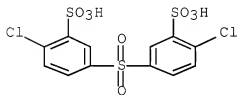
RN 929035-13-2 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
polymer with 2,6-dichlorobenzonitrile and 4,4'-thiobis[benzenethiol]
(CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

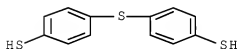


● 2 Na

CM 2

CRN 19362-77-7

CMF C12 H10 S3



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N

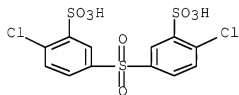


RN 929035-14-3 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),
 polymer with 4,4'-cyclohexylidenebis[phenol] and
 2,6-dichlorobenzonitrile (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

CM 2

CRN 1194-65-6

CMF C7 H3 Cl2 N

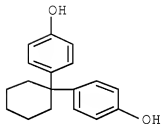


10/714,394

CM 3

CRN 843-55-0

CMF C18 H20 O2



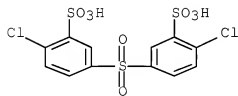
RN 929035-15-4 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol and bis(4-chlorophenyl)methanone (CA INDEX NAME)

CM 1

CRN 51698-33-0

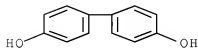
CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

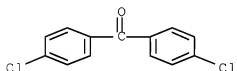
CM 2

CRN 92-88-6
CMF C12 H10 O2



CM 3

CRN 90-98-2
CMF C13 H8 Cl2 O



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- ST polymer electrolyte fuel cell phosphite antioxidant; thioether antioxidant fuel cell electrolyte membrane; hindered amine light stabilizer fuel cell; phenolic antioxidant fuel cell electrode catalyst; sulfo arom polysulfone fuel cell electrolyte
- IT Thioethers
RL: MOA (Modifier or additive use); USES (Uses)
(antioxidants; membrane-electrode assemblies containing antioxidants and light stabilizers for polymer electrolyte fuel cells)
- IT Polyoxyalkylenes, uses
RL: CAT (Catalyst use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, Nafion, binder for electrode catalyst layers; membrane-electrode assemblies containing antioxidants and light stabilizers for polymer electrolyte fuel cells)
- IT Light stabilizers
(hindered amines; membrane-electrode assemblies containing antioxidants and light stabilizers for polymer electrolyte fuel

- cells)
- IT Amines, uses
 - RL: MOA (Modifier or additive use); USES (Uses)
 - (hindered, light stabilizers; membrane-electrode
 - assemblies containing antioxidants and light stabilizers for
- polymer
 - electrolyte fuel cells)
- IT Fuel cell electrodes
 - Fuel cell electrolytes
 - (membrane-electrode assemblies containing antioxidants and
 - light stabilizers for polymer electrolyte fuel cells)
- IT Antioxidants
 - (phenolic, for catalyst layers;
 - membrane-electrode assemblies containing
 - antioxidants and light stabilizers for polymer electrolyte fuel
 - cells)
- IT Polyethers, uses
 - RL: MOA (Modifier or additive use); USES (Uses)
 - (phosphite-containing, antioxidants; membrane-electrode
 - assemblies containing antioxidants and light stabilizers for
- polymer
 - electrolyte fuel cells)
- IT Antioxidants
 - (phosphites or thioethers; membrane-electrode
 - assemblies containing antioxidants and light stabilizers for
- polymer
 - electrolyte fuel cells)
- IT Polyethers, uses
 - RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
 - (Technical or engineered material use); PREP (Preparation); USES
 - (Uses)
 - (polycarbonate-, sulfo-containing; membrane-electrode
 - assemblies containing antioxidants and light stabilizers for
- polymer
 - electrolyte fuel cells)
- IT Polysulfones, uses
 - RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
 - (Technical or engineered material use); PREP (Preparation); USES
 - (Uses)
 - (polycarbonate-polyether-, sulfo-containing; membrane
 - electrode assemblies containing antioxidants and light
- stabilizers
 - for polymer electrolyte fuel cells)
- IT Polyethers, uses
 - RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
 - (Technical or engineered material use); PREP (Preparation); USES
 - (Uses)

(polycarbonate-polysulfone-, sulfo-containing; membrane
 -electrode assemblies containing antioxidants and light
 stabilizers
 for polymer electrolyte fuel cells)

IT Polysulfones, uses
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
 (Technical or engineered material use); PREP (Preparation); USES
 (Uses)
 (polyether-, cardo, sulfo-containing; membrane-electrode
 assemblies containing antioxidants and light stabilizers for
 polymer
 electrolyte fuel cells)

IT Polysulfones, uses
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
 (Technical or engineered material use); PREP (Preparation); USES
 (Uses)
 (polyether-, fluorine-containing, sulfo-containing; membrane
 -electrode assemblies containing antioxidants and light
 stabilizers
 for polymer electrolyte fuel cells)

IT Polycarbonates, uses
 Polysulfones, uses
 Polysulfones, uses
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
 (Technical or engineered material use); PREP (Preparation); USES
 (Uses)
 (polyether-, sulfo-containing; membrane-electrode
 assemblies containing antioxidants and light stabilizers for
 polymer
 electrolyte fuel cells)

IT Fluoropolymers, uses
 Polycarbonates, uses
 Polythioethers
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
 (Technical or engineered material use); PREP (Preparation); USES
 (Uses)
 (polyether-polysulfone-, sulfo-containing; membrane
 -electrode assemblies containing antioxidants and light
 stabilizers
 for polymer electrolyte fuel cells)

IT Cardo polymers
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
 (Technical or engineered material use); PREP (Preparation); USES
 (Uses)
 (polyether-polysulfones, sulfo-containing; membrane
 -electrode assemblies containing antioxidants and light
 stabilizers

- for polymer electrolyte fuel cells)
- IT Polysulfones, uses
 - RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 - (polyether-polythioether-, sulfo-containing; membrane-electrode assemblies containing antioxidants and light stabilizers
- for polymer electrolyte fuel cells)
- IT Fuel cells
 - (polymer electrolyte; membrane-electrode assemblies containing antioxidants and light stabilizers for polymer electrolyte fuel cells)
- IT Fluoropolymers, uses
 - RL: CAT (Catalyst use); USES (Uses)
 - (polyoxyalkylene-, sulfo-containing, ionomers, Nafion, binder for electrode catalyst layers; membrane-electrode assemblies containing antioxidants and light stabilizers for polymer electrolyte fuel cells)
- IT Ionomers
 - RL: CAT (Catalyst use); USES (Uses)
 - (polyoxyalkylenes, fluorine- and sulfo-containing, Nafion, binder for electrode catalyst layers; membrane-electrode assemblies containing antioxidants and light stabilizers for polymer electrolyte fuel cells)
- IT Polyethers, uses
 - RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 - (polysulfone-, cardo, sulfo-containing; membrane-electrode assemblies containing antioxidants and light stabilizers for polymer electrolyte fuel cells)
- IT Polyethers, uses
 - RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 - (polysulfone-, fluorine-containing, sulfo-containing; membrane-electrode assemblies containing antioxidants and light stabilizers for polymer electrolyte fuel cells)
- IT Polyethers, uses
 - Polyethers, uses

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polysulfone-, sulfo-containing; membrane-electrode assemblies containing antioxidants and light stabilizers for

polymer

electrolyte fuel cells)

IT Polyethers, uses

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polysulfone-polythioether-, sulfo-containing; membrane-electrode assemblies containing antioxidants and light

stabilizers

for polymer electrolyte fuel cells)

IT Ionic conductors

(protonic, electrolyte membranes; membrane

-electrode assemblies containing antioxidants and light

stabilizers

for polymer electrolyte fuel cells)

IT 1455-42-1D, 3,9-Bis(2-hydroxy-1,1-dimethylethyl)-2,4,8,10-tetraoxaspiro[5.5]undecane, mixed ester with butanetetra-carboxylic acid and pentamethylpiperidinol 1703-58-8D, 1,2,3,4-Butanetetra-carboxylic acid, mixed ester with pentamethylpiperidinol and bis[(hydroxy)dimethylethyl]tetraoxaspiroundecane 2403-89-6D, 1,2,2,6,6-Pentamethyl-4-piperidinol, mixed ester with butanetetra-carboxylic acid and bis[(hydroxy)dimethylethyl]tetraoxaspiroundecane 6683-19-8, Irganox 1010 26063-63-8, JPH 3800 29598-76-3, Pentaerythritoltetrakis(3-laurylthiopropionate) 115055-30-6, ADK Stab LA 63P

RL: MOA (Modifier or additive use); USES (Uses)

(antioxidant; membrane-electrode assemblies containing antioxidants and light stabilizers for polymer electrolyte fuel cells)

IT 267877-35-0DP, hydrolyzed 627538-51-6DP, hydrolyzed 681035-31-4DP, 4,4'-Biphenol-2,6-dichlorobenzonitrile-disodium 4,4'-dichloro-3,3'-disulfodiphenyl sulfone copolymer, hydrolyzed 681035-35-8DP, hydrolyzed 681035-36-9DP, hydrolyzed 864962-86-2DP, hydrolyzed 916849-36-0DP, hydrolyzed 916849-42-8DP, hydrolyzed 916849-45-1DP, hydrolyzed 929035-11-0DP, hydrolyzed 929035-12-1DP, hydrolyzed 929035-13-2DP, hydrolyzed 929035-14-3DP, hydrolyzed 929035-15-4DP, hydrolyzed

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(membrane-electrode assemblies containing antioxidants and light stabilizers for polymer electrolyte fuel cells)

L28 ANSWER 14 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2007:281657 HCAPLUS Full-text

DN 146:341014

TI Manufacture of sulfo-containing polymers, compositions containing the polymers, cation exchangers made of the polymers, and polymer-electrolyte fuel cell membrane-electrode assemblies (MEA) employing the cation exchangers

IN Kitamura, Kota; Sakaguchi, Yoshimitsu

PA Toyobo Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 29pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	---	-----	-----	
PI	JP 2007063533	A	20070315	JP 2006-187807	20060707

PRAI JP 2005-223993 A 20050802

AB Sulfo-containing polymers have repeating units
 [[Z2Ar1(Z1Ar2Z1Ar3)n(Z1Ar2Z1Ar4)m(Z3Ar6Z3Ar7)o]Z2Ar5]p [Ar1 = Ar3, Ar4; Ar2 = biphenylene, Q1, Q2; Ar4 = divalent aromatic group having electron-withdrawing group and sulfo (salts/derivs.); Ar5 = Q3; W = O, S, C(Me)2, cyclohexyl, etc.; q ≥ 1; Ar3 = electron-withdrawing divalent aromatic group; Ar6 = divalent aromatic group other than Ar2; Ar7 = Ar3, Ar4; Z1-3 = O, S; n ≥ 1; m ≥ 1; p ≥ 1; o ≥ 0], wherein units of (Z1Ar2Z1Ar3), (Z1Ar2Z1Ar4), and (Z3Ar6Z3Ar7) are in random arrangement or form continuous segments. The polymers are manufactured by reaction of oligomers having units of (Z1Ar2Z1Ar3), (Z1Ar2Z1Ar4), and optionally (Z3Ar6Z3Ar7) and having reactive end groups with compds. containing Q3. The polymers show small expansion in water and high bond strength with electrode catalyst layers.

IT 916849-41-7P 916849-42-8P 916849-43-9P

916849-44-0P 916849-45-1P 916849-47-3P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(manufacture of proton-exchangeable sulfo-containing

poly(thio)ethers for

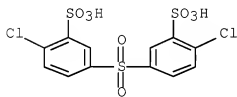
MEA of polymer-electrolyte fuel cells)

RN 916849-41-7 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

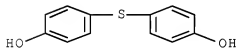


● 2 Na

CM 2

CRN 2664-63-3

CMF C12 H10 O2 S



CM 3

CRN 1194-65-6

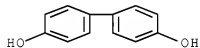
CMF C7 H3 Cl2 N



CM 4

CRN 92-88-6

CMF C12 H10 O2



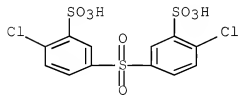
RN 916849-42-8 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile and 4,4'-thiobis[benzenethiol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



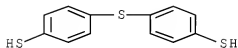
● 2 Na

10/714,394

CM 2

CRN 19362-77-7

CMF C12 H10 S3



CM 3

CRN 1194-65-6

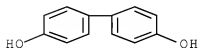
CMF C7 H3 Cl2 N



CM 4

CRN 92-88-6

CMF C12 H10 O2



RN 916849-43-9 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile and

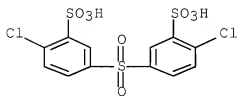
10/714,394

4,4'-(1-methylethylidene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

CM 2

CRN 1194-65-6

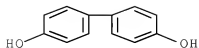
CMF C7 H3 Cl2 N



CM 3

CRN 92-88-6

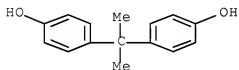
CMF C12 H10 O2



CM 4

CRN 80-05-7

CMF C15 H16 O2



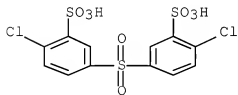
RN 916849-44-0 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethyldiene]bis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



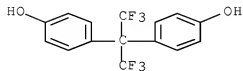
● 2 Na

10/714,394

CM 2

CRN 1478-61-1

CMF C15 H10 F6 O2



CM 3

CRN 1194-65-6

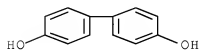
CMF C7 H3 Cl2 N



CM 4

CRN 92-88-6

CMF C12 H10 O2



RN 916849-45-1 HCAPLUS

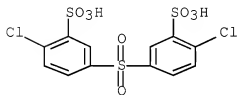
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2),

polymer with [1,1'-biphenyl]-4,4'-diol,
4,4'-cyclohexylidenebis[phenol] and 2,6-dichlorobenzonitrile (CA
INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

CM 2

CRN 1194-65-6

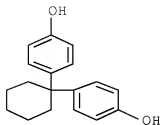
CMF C7 H3 Cl2 N



CM 3

CRN 843-55-0

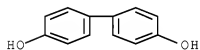
CMF C18 H20 O2



CM 4

CRN 92-88-6

CMF C12 H10 O2



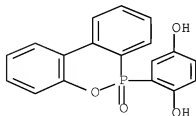
RN 916849-47-3 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 99208-50-1

CMF C18 H13 O4 P

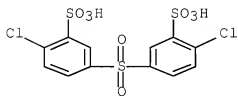


10/714,394

CM 2

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

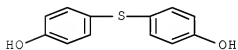


● 2 Na

CM 3

CRN 2664-63-3

CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

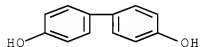
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

CMF C12 H10 O2



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38

IT Cation exchange membranes

Fuel cell electrolytes

Polyelectrolytes

(manufacture of proton-exchangeable sulfo-containing
 poly(thio)ethers for

MEA of polymer-electrolyte fuel cells)

IT 916849-41-7P 916849-42-8P 916849-43-9P

916849-44-0P 916849-45-1P 916849-47-3P

RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)

(manufacture of proton-exchangeable sulfo-containing
 poly(thio)ethers for

MEA of polymer-electrolyte fuel cells)

L28 ANSWER 15 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2006:759900 HCAPLUS [Full-text](#)

DN 145:214305

TI Fuel cell electrodes with metal catalyst

layers containing alkylcellulose binders and fuel cells

IN Adachi, Masaya; Kono, Satoshi; Kitai, Masayuki

PA Toray Industries, Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	---	-----	-----	
PI	JP 2006202598	A	20060803	JP 2005-12620	20050120

PRAI JP 2005-12620 20050120

AB The electrodes are equipped with catalyst layers consisting of (A) metal particles and/or metal-carrying particles and (B) binders including alkylcellulose having ionic groups. Preferably, the anodes are equipped with the said catalyst layers and more preferably, contain sulfonated aromatic hydrocarbon polymer membranes containing components derived from 9,9-bis(4-hydroxyphenyl)fluorene and/or 4,4'-dihydroxytetraphenylmethane. The batteries may be those operated by charging water-containing liquid fuel to the anodes.

IT 862772-94-9P

RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
 (electrolyte; fuel cell electrodes with metal catalyst layers containing ionic alkylcellulose binders)

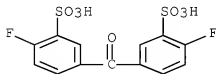
RN 862772-94-9 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt (1:2), polymer with bis(4-fluorophenyl)methanone and 4,4'-(9H-fluoren-9-ylidene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 210531-45-6

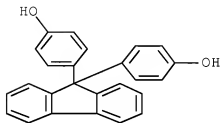
CMF C13 H8 F2 O7 S2 . 2 Na



CM 2

CRN 3236-71-3

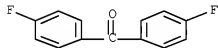
CMF C25 H18 O2



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



IT 210531-45-6F, Disodium

3,3'-disulfonate-4,4'-difluorobenzophenone

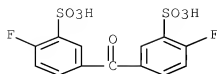
RL: IMF (Industrial manufacture); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)

(fuel cell electrodes with metal catalyst

layers containing ionic alkylcellulose binders)

RN 210531-45-6 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt (1:2)
(CA INDEX NAME)



● 2 Na

- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST fuel cell electrode metal catalyst layer
binder; alkylcellulose ionic binder fuel cell electrode
- IT Fuel cells
(aqueous liquid fuel-operated; fuel cell electrodes with
metal catalyst layers containing ionic
alkylcellulose binders)
- IT Fuel cell anodes
Fuel cell electrodes
(fuel cell electrodes with metal catalyst
layers containing ionic alkylcellulose binders)
- IT 9086-60-6, Carboxymethylcellulose ammonium salt
RL: CAT (Catalyst use); USES (Uses)
(DN 800H; fuel cell electrodes with metal
catalyst layers containing ionic alkylcellulose
binders)
- IT 862772-94-9P
RL: DEV (Device component use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(electrolyte; fuel cell electrodes with metal
catalyst layers containing ionic alkylcellulose
binders)
- IT 647838-24-2, Hispec 6000 874384-40-4, TEC 10V50E 904299-74-7,
Hispec 7000
RL: CAT (Catalyst use); USES (Uses)
(fuel cell electrodes with metal catalyst
layers containing ionic alkylcellulose binders)
- IT 210531-45-6P, Disodium
3,3'-disulfonate-4,4'-difluorobenzophenone
RL: IMF (Industrial manufacture); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)
(fuel cell electrodes with metal catalyst
layers containing ionic alkylcellulose binders)
- IT 345-92-6, 4,4'-Difluorobenzophenone
RL: RCT (Reactant); RACT (Reactant or reagent)

(fuel cell electrodes with metal catalyst
layers containing ionic alkylcellulose binders)

L28 ANSWER 16 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN
AN 2006:436788 HCAPLUS Full-text
DN 144:471396
TI Membrane-electrode assembly for fuel cell
IN Kanaoka, Nagayuki; Iguchi, Masaru; Sohma, Hiroshi
PA Honda Motor Co., Ltd., Japan
SO PCT Int. Appl., 61 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	---	-----	-----	
PI	WO 2006048942	A1	20060511	WO 2004-JP16501	20041101
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
	RW:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
	CA 2579014	A1	20060511	CA 2004-2579014	20041101
	DE 112004003007	T5	20071025	DE 2004-112004003007	20041101
	US 20080070085	A1	20080320	US 2006-596648	20061116
PRAI	WO 2004-JP16501	W	20041101		
AB	A membrane-electrode assembly for a solid polymer fuel cell is excellent in hot water resistance, oxidation resistance and dimensional stability at low temps. and can provide excellent power generation performance even under low-temperature environment. The membrane-electrode assembly has an electrolyte membrane held between				

a pair of electrode catalyst layer; where polymer electrolyte membrane comprises a sulfonated product of a polyarylene polymer comprising repeating units of the formula $(C_6H_3Z_1R_1)_n$ (Z_1 = divalent atom or organic group, or direct bond; and R_1 = aromatic group or its derivative; and n is and integer).

IT 886598-59-0 886598-60-3 886598-61-4

886598-62-5 886598-63-6

RL: DEV (Device component use); FMU (Formation, unclassified); FORM (Formation, nonpreparative); USES (Uses)

(electrolyte membranes containing sulfonated polyarylene polymers for fuel cells)

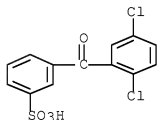
RN 886598-59-0 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, polymer with 2,6-dichlorobenzonitrile and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA INDEX NAME)

CM 1

CRN 873815-38-4

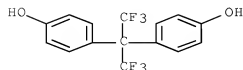
CMF C13 H8 C12 O4 S



CM 2

CRN 1478-61-1

CMF C15 H10 F6 O2



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N



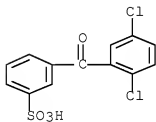
RN 886598-60-3 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, polymer with
2,6-dichlorobenzonitrile and 4,4'-(9H-fluoren-9-ylidene)bis[phenol]
(9CI) (CA INDEX NAME)

CM 1

CRN 873815-38-4

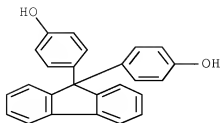
CMF C13 H8 Cl2 O4 S



CM 2

CRN 3236-71-3

CMF C25 H18 O2



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N

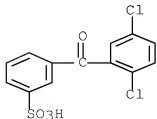


RN 886598-61-4 HCAPLUS
 CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, polymer with
 2,6-dichlorobenzonitrile, 4,4'-(9H-fluoren-9-ylidene)bis[phenol] and
 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol]
 (9CI) (CA INDEX NAME)

CM 1

CRN 873815-38-4

CMF C13 H8 Cl2 O4 S

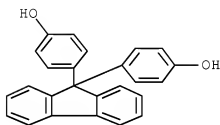


10/714,394

CM 2

CRN 3236-71-3

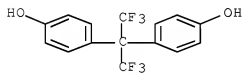
CMF C25 H18 O2



CM 3

CRN 1478-61-1

CMF C15 H10 F6 O2



CM 4

CRN 1194-65-6

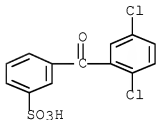
CMF C7 H3 Cl2 N



RN 886598-62-5 HCAPLUS
 CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, polymer with
 [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile and
 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol]
 (9CI) (CA INDEX NAME)

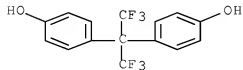
CM 1

CRN 873815-38-4
 CMF C13 H8 Cl2 O4 S



CM 2

CRN 1478-61-1
 CMF C15 H10 F6 O2



CM 3

CRN 1194-65-6

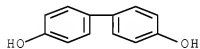
CMF C7 H3 Cl2 N



CM 4

CRN 92-88-6

CMF C12 H10 O2



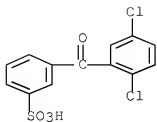
RN 886598-63-6 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, polymer with
 bis(4-chlorophenyl)methanone and
 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol]
 (9CI) (CA INDEX NAME)

CM 1

CRN 873815-38-4

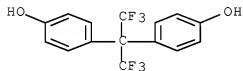
CMF C13 H8 Cl2 O4 S



CM 2

CRN 1478-61-1

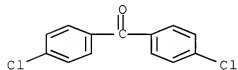
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O



IC ICM H01M008-02

ICS C08G075-00; C08G065-40; C08G061-12

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Fuel cell electrodes

Fuel cell electrolytes

(electrolyte membranes containing sulfonated polyarylene

polymers for fuel cells)

IT Carbon black, uses
Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(electrolyte membranes containing sulfonated polyarylene polymers for fuel cells)

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; electrolyte membranes containing sulfonated polyarylene polymers for fuel cells)

IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; electrolyte membranes containing sulfonated polyarylene polymers for fuel cells)

IT Ionomers
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; electrolyte membranes containing sulfonated polyarylene polymers for fuel cells)

IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(electrolyte membranes containing sulfonated polyarylene polymers for fuel cells)

IT 9002-84-0, PTFE
RL: DEV (Device component use); USES (Uses)
(electrolyte membranes containing sulfonated polyarylene polymers for fuel cells)

IT 386598-59-0 386598-60-3 386598-61-4
386598-62-5 386598-63-6
RL: DEV (Device component use); FMU (Formation, unclassified); FORM (Formation, nonpreparative); USES (Uses)
(electrolyte membranes containing sulfonated polyarylene polymers for fuel cells)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L28 ANSWER 17 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN
AN 2006:117649 HCAPLUS Full-text
DN 144:195256
TI Polymer electrolyte fuel cell
IN Saito, Shin; Iwasaki, Katsuhiko
PA Sumitomo Chemical Co., Ltd., Japan
SO Can. Pat. Appl., 41 pp.
CODEN: CPXXEB
DT Patent

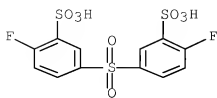
LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	CA 2513518	A1	20060130	CA 2005-2513518	20050726
	EP 1626453	A2	20060215	EP 2005-106807	20050725
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
	JP 2006066391	A	20060309	JP 2005-217020	20050727
	US 20060280999	A1	20061214	US 2005-189723	20050727
	KR 2006048879	A	20060518	KR 2005-69036	20050728
PRAI	JP 2004-223434	A	20040730		
AB	The invention concerns a polymer electrolyte fuel cell comprising: a solid polymer electrolyte membrane containing an aromatic polymer electrolyte; an electrode comprising a catalyst layer and a gas diffusion layer as an anode and a cathode to be joined on both surfaces of this solid polymer electrolyte membrane; a gas sealing material to be disposed in a periphery of the gas diffusion layer; and a separator having a reaction gas flow field; wherein the gas diffusion layer surrounds the whole outer edge of the gas flow field of the separator and has a larger area than an area occupied by the outer edge of the gas flowfield of the separator is provided.				
IT	875098-09-2P RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses) (polymer electrolyte fuel cell)				
RN	875098-09-2 HCAPLUS				
CN	Benzenesulfonic acid, 3,3'-sulfonylbis[6-fluoro-, dipotassium salt, polymer with 2,5-dihydroxybenzenesulfonic acid, 1,1'-sulfonylbis[4-fluorobenzene] and 4,4'-sulfonylbis[phenol] (9CI) (CA INDEX NAME)				
CM	1				
CRN	816417-98-8				

10/714,394

CMF C12 H8 F2 O8 S3 . 2 K

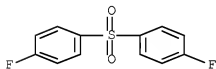


● 2 K

CM 2

CRN 383-29-9

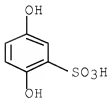
CMF C12 H8 F2 O2 S



CM 3

CRN 88-46-0

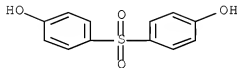
CMF C6 H6 O5 S



CM 4

CRN 80-09-1

CMF C12 H10 O4 S



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 IT 24938-68-9P 875098-09-2P
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP
 (Preparation); USES (Uses)
 (polymer electrolyte fuel cell)

L28 ANSWER 18 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2005:1149667 HCAPLUS Full-text

DN 143:424642

TI Solid polymer electrolyte composite membranes useful for
 fuel cells

IN Ishikawa, Junichi; Omi, Katsuhiko; Toriida, Masahiro; Fujiyama,
 Akiko; Takamatsu, Kuniyuki; Tamai, Masashi

PA Mitsui Chemicals Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 16 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2005298564	A	20051027	JP 2004-113071	20040407
PRAI	JP 2004-113071		20040407		
AB	The membranes comprise solid polymer electrolyte membranes composed of aromatic hydrocarbon polymers having protonic acid groups, and compound layers having basic functional groups on the surface of the membranes. The membranes show good protonic conductivity, low				

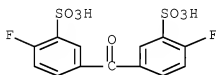
methanol permeability, and improved adhesion to catalyst electrode layers.

- IT 515144-27-1DP, sodium-removed, complex with amines
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (crosslinked; solid polymer electrolyte composite membranes useful for fuel cells)
- RN 515144-27-1 HCAPLUS
- CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt (1:2), polymer with bis(4-fluorophenyl)methanone and 4,4'-methylenebis[2,6-dimethylphenol] (CA INDEX NAME)

CM 1

CRN 210531-45-6

CMF C13 H8 F2 O7 S2 . 2 Na

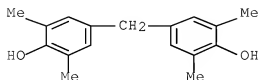


● 2 Na

CM 2

CRN 5384-21-4

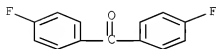
CMF C17 H20 O2



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



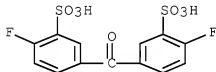
IT 210531-45-6P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP

(Preparation); RACT (Reactant or reagent)

(solid polymer electrolyte composite membranes useful
for fuel cells)

RN 210531-45-6 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt (1:2)
(CA INDEX NAME)

●2 Na

IC ICM C08J005-22

ICS C08G065-40; C08J007-04; H01B001-06; H01M008-02; H01M008-10;
C08L101-00CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38ST solid polymer electrolyte composite membrane fuel cell;
fluorobenzophenone fluorobenzenesulfonate carbonyl methyl
hydroxyphenyl methane polymer; octyldiamine complex sulfonic acid
polymer electrolyte

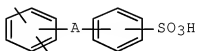
IT Polyketones

RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)

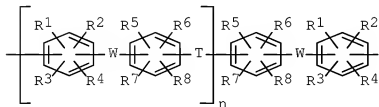
- (polyether-, crosslinked; solid polymer electrolyte composite membranes useful for fuel cells)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-, crosslinked; solid polymer electrolyte composite membranes useful for fuel cells)
- IT Ionic conductors
 (protonic; solid polymer electrolyte composite membranes useful for fuel cells)
- IT Fuel cell electrolytes
 Polyelectrolytes
 Solid electrolytes
 (solid polymer electrolyte composite membranes useful for fuel cells)
- IT 147-24-ODP, Diphenhydramine hydrochloride, complex with sulfonic acid-containing polyether-polyketones 515144-27-IDP, sodium-removed, complex with amines
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (crosslinked; solid polymer electrolyte composite membranes useful for fuel cells)
- IT 210531-45-6P
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (solid polymer electrolyte composite membranes useful for fuel cells)
- IT 373-44-4DP, 1,8-Octanediamine, complex with crosslinked sulfonic acid-containing polyether-polyketones 9003-47-8DP,
 Polyvinylpyridine,
 complex with crosslinked sulfonic acid-containing polyether-polyketones
 129825-84-9DP, Dodecanediamine, complex with crosslinked sulfonic acid-containing polyether-polyketones
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (solid polymer electrolyte composite membranes useful for fuel cells)
- IT 345-92-6, 4,4'-Difluorobenzophenone
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (solid polymer electrolyte composite membranes useful for fuel cells)
- L28 ANSWER 19 OF 19 HCAPLUS COPYRIGHT 2008 ACS on STN
 AN 2004:402980 HCAPLUS Full-text
 DN 140:409627
 TI Electrode structure for polymer electrolyte fuel cells

IN Sohma, Hiroshi; Iguchi, Masaru; Kanaoka, Nagayuyki; Kaji, Hayato;
 Morikawa, Hiroshi; Mitsuta, Naoki
 PA Honda Motor Co., Ltd., Japan
 SO Eur. Pat. Appl., 26 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 FAN.CNT 1

	PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
PI	EP 1420473	A1	20040519	EP 2003-26194	200311 17
	EP 1420473	B1	20060412		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	US 20040197632	A1	20041007	US 2003-714394	200311 17
	JP 2005158265	A	20050616	JP 2003-387362	200311 18
PRAI	JP 2002-333143	A	20021118		
	JP 2003-371047	A	20031030		
GI					

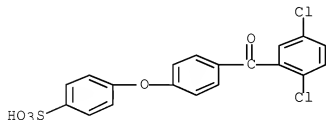


I



II

- AB The present invention provides an electrode structure for polymer electrolyte fuel cells, inexpensive, and exhibiting excellent power production capacity and durability even under high temperature/low humidity conditions, and also provides a polymer electrolyte fuel cell which incorporates the same electrode structure. The present invention also provides an elec. device and transportation device, each incorporating the same polymer electrolyte fuel cell. The electrode structure comprises a pair of electrode catalyst layers, each containing a catalyst supported by carbon particles, and polymer electrolyte membrane placed between these electrode catalyst layers. The polymer electrolyte membrane is of a sulfonated polyarylene composed of 0.5 to 100% by mol of the first repeating unit represented by (I) and 0 to 99.5% by mol of the second repeating unit represented by (II): (wherein, A is a divalent organic group; and a benzene ring includes its derivative; -W- is a divalent electron attracting group; -T- is a divalent organic group; and R1 to R8 are a hydrogen atom or fluorine atom, an alkyl group, fluorine-substituted alkyl group, allyl group, aryl group or cyano group, and may be the same or different).
- IT 663920-23-8P, Benzenesulfonic acid,
4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt
RL: SPN (Synthetic preparation); PREP (Preparation)
(electrode structure for polymer electrolyte fuel cells)
- RN 663920-23-8 HCAPLUS
- CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt (1:1) (CA INDEX NAME)



● Na

- IC ICM H01M008-10
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- IT 122325-09-1P 663920-23-8P, Benzenesulfonic acid,
4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt 663920-24-9P,

4-[4-(2,5-Dichlorobenzoyl)phenoxy]benzenesulfonyl chloride
 690247-88-2P 690247-89-3P
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (electrode structure for polymer electrolyte fuel cells)

II

> d 161 1-2 bib abs hitstr hitind

L61 ANSWER 1 OF 2 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2007:116631 HCAPLUS Full-text

DN 146:209689

TI Organic-inorganic hybrid catalyst layer for fuel cell

IN Kawai, Junji; Otsuki, Toshitaka; Fukuda, Kaoru; Takahashi,
 Ryoichiro; Shinkai, Hiroshi

PA Jsr Ltd., Japan; Honda Motor Co., Ltd.

SO Jpn. Kokai Tokkyo Koho, 20pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	JP 2007026775	A	20070201	JP 2005-204608	

200507

13

PRAI JP 2005-204608 20050713

AB The title catalyst layer comprises catalyst loaded C particles; a sulfonic acid group-containing polyarylene which consists of a 1st structure unit represented by C6H3Y(C6H4Z)m(C6H4-k(SO3H)kZ)nAr [Y is ≥ 1 structure selected from CO, SO2, SO, CONH, COO, (CF2)1 (1 = integer 1-10), and C(CF3)2; Z = direct bond or ≥ 1 structure selected from (CH2)1 (1 = integer 1-10), O, and S; Ar = aromatic group having substituent represented by SO3H, O(CH2)pSO3H, or O(CF2)pSO3H; p = integer 1-12; m = integer 0-10; n = integer 0-10; and k = integer 1-4] and a 2nd structure unit represented by [(C6R1R2R3R4D)sC6R5R6R7R8B(C6R9R10R11R12A)tC6R13R14R15R16B]r(C6R1R2R3R4D)sC6R5R6R7R8 [A, D = direct bond, or ≥ 1 structure selected from O, S, CO, SO2, SO, CONH, COO, (CF2)11 (1 = integer 1-10), (CH2)11 (1 = integer 1-10), CR172 (R17 = aliphatic hydrocarbon, aromatic hydrocarbon, and halogenated hydrocarbon group), cyclohexylidene, and fluorenylidene group; B = O or S; R1-16 is ≥ 1 atom or group selected from H, F, (halogenated) alkyl, allyl, aryl, nitro, and nitrile

group; s,t = integer 0-4; and r = 0 or integer ≥ 1 ; and a metalloxane polymer.

IT 7440-06-4, Platinum, uses

RL: CAT (Catalyst use); USES (Uses)

(electrode catalyst layers containing sulfonated polyarylene for fuel cells)

RN 7440-06-4 HCAPLUS

CN Platinum (CA INDEX NAME)

Pt

IT 917252-67-6

RL: TEM (Technical or engineered material use); USES (Uses)

(electrode catalyst layers containing sulfonated polyarylene for fuel cells)

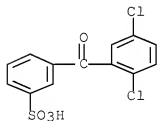
RN 917252-67-6 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, polymer with bis(4-chlorophenyl)methanone, 1,1'-sulfonylbis[4-chlorobenzene] and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA INDEX NAME)

CM 1

CRN 873815-38-4

CMF C13 H8 C12 O4 S

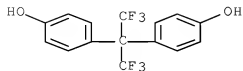


CM 2

CRN 1478-61-1

10/714,394

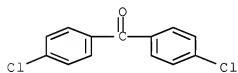
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

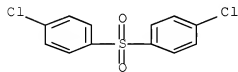
CMF C13 H8 Cl2 O



CM 4

CRN 80-07-9

CMF C12 H8 Cl2 O2 S

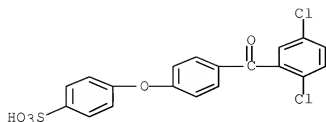


CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(electrode catalyst layers containing sulfonated
polyarylene for fuel cells)
IT 317252-67-6

RL: TEM (Technical or engineered material use); USES (Uses)
 (electrode catalyst layers containing sulfonated polyarylene for
 fuel cells)

L61 ANSWER 2 OF 2 HCAPLUS COPYRIGHT 2008 ACS on STN
 AN 2005:1103231 HCAPLUS Full-text
 DN 143:389771
 TI Polymer electrolyte fuel cell
 IN Fukuda, Kaoru; Eguchi, Taku; Tsuji, Makoto
 PA Honda Motor Co., Ltd, Japan
 SO U.S. Pat. Appl. Publ., 10 pp.
 CODEN: USXXCO
 DT Patent
 LA English
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 20050227138	A1	20051013	US 2005-98425	20050405
	JP 2005302339	A	20051027	JP 2004-112673	20040407
	JP 4116585	B2	20080709		
PRAI	JP 2004-112673	A	20040407		
AB	A polymer electrolyte fuel cell consists of plural units, and the unit has an anode side separator, an anode diffusion layer, an anode catalytic layer, polymer electrolyte membrane, a cathode catalytic layer, a cathode diffusion layer, and a cathode side separator. The cathode catalytic layer further includes a catalyst in which platinum or platinum alloy is supported on a carbon supporting body having an average lattice space of [002] surface of 0.338 to 0.355 nm and sp. surface area of the supporting body of 80 to 250 m ² /g, electrolyte containing ion exchange resin, and vapor grown carbon fiber. Furthermore, a water holding layer containing ion exchange resin, carbon particles, and vapor grown carbon fiber is arranged at an interface of the cathode diffusion layer and the cathode catalytic layer.				
IT	663920-23-8P				
	RL: SPN (Synthetic preparation); PREP (Preparation) (polymer electrolyte fuel cell)				
RN	663920-23-8 HCAPLUS				
CN	Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt (1:1) (CA INDEX NAME)				



● Na

IC ICM H01M004-94
 ICS H01M004-96; H01M008-10
 INCL 429042000; 429044000; 429033000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 IT 7440-44-0, Carbon, uses
 RL: DEV (Device component use); USES (Uses)
 (particles; polymer electrolyte fuel cell)
 IT 69266-28-0P 663920-23-8P 663920-24-9P 663920-25-0P
 663920-27-2P
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (polymer electrolyte fuel cell)

=> d 15 1-5 bib abs hitstr hitind
 L5 HAS NO ANSWERS
 L5 SCR 2043

=> d 156 1-5 bib abs hitstr hitind

L56 ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2008 ACS on STN
 AN 2008:859827 HCAPLUS Full-text
 DN 149:157223
 TI Polymer electrolyte membrane/catalyst assembly (MEA), its
 manufacture, and its hydrogen-fueled polymer electrolyte fuel cells
 IN Kitamura, Kota; Sakaguchi, Yoshimitsu; Yamaguchi, Hiroki; Yamashita,
 Masahiro; Yamada, Takatoshi; Takase, Satoshi; Miyagawa, Shinji
 PA Toyobo Co., Ltd., Japan; Nissan Motor Co., Ltd.
 SO Jpn. Kokai Tokkyo Koho, 16pp.
 CODEN: JKXXAF
 DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	JP 2008166050	A	20080717	JP 2006-352397	200612 27
PRAI	JP 2006-352397		20061227		
GI					

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB The MEA contains a polymer electrolyte membrane comprising (1) a polymer represented by the general formula I [$n_1, n_2, m_1-m_3 = \geq 1$ -integer satisfying $n_1/(n_1 + n_2) = 0.40-0.70$, $m_3/(m_1 + m_2 + m_3) = 0.005-0.05$, and $m_2/(m_1 + m_2 + m_3) = 0.01-0.20$] and (2) 5-15% of a polymer II [$n_3 = \geq 1$ -integer; $m_4, m_5 = \geq 1$ -integer satisfying $m_5/(m_4 + m_5) = 0.60-0.80$] and an electrode catalyst layer which is bonded directly at least on one side of the polymer electrolyte membrane, where the surface roughness of the membrane/catalyst interface is $\leq 1 \mu\text{m}$. The MEA is prepared by direct application of a catalyst slurry containing an electrode catalyst, a polymer electrolyte and a solvent at least on one side of the polymer electrolyte membrane containing the polymer I and 5-15% of the polymer II in such a way that the surface roughness of the membrane/catalyst interface becomes $\leq 1 \mu\text{m}$. The hydrogen-fueled polymer electrolyte fuel cell shows high output performance even in low moisturizing condition and also shows excellent durability.

IT 1027300-88-4P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(manufacture of polymer electrolyte membrane/electrode assembly

for

hydrogen-fueled polymer electrolyte fuel cells)

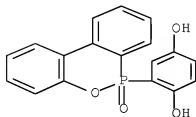
RN 1027300-88-4 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with 2,6-dichlorobenzonitrile, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

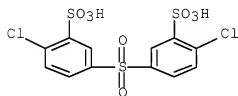
10/714,394

CRN 99208-50-1
CMF C18 H13 O4 P



CM 2

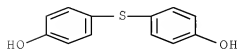
CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

CM 3

CRN 2664-63-3
CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

CMF C7 H3 Cl2 N



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Carbon black, uses

RL: TEM (Technical or engineered material use); USES (Uses)
 (Vulcan XC 72R, gas diffusion layer; manufacture
 of polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)

IT 354114-33-3, TGP-H 060

RL: TEM (Technical or engineered material use); USES (Uses)
 (gas diffusion layer; manufacture of polymer
 electrolyte membrane/electrode assembly for hydrogen-fueled
 polymer electrolyte fuel cells)

IT 861709-53-7P, 2,5-Dicarboxybenzenesulfonic acid monosodium
 salt-3,5-dicarboxyphenylphosphonic
 acid-3,3',4,4'-tetraaminodiphenylsulfone copolymer
 1027300-88-4P

RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)

(manufacture of polymer electrolyte membrane/electrode assembly

for

hydrogen-fueled polymer electrolyte fuel cells)

IT 7440-06-4, Platinum, uses 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses)
 (platinum/carbon electrode catalyst
 layer; manufacture of polymer electrolyte membrane/electrode
 assembly for hydrogen-fueled polymer electrolyte fuel cells)

L56 ANSWER 2 OF 5 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2008:859826 HCAPLUS Full-text

DN 149:180166

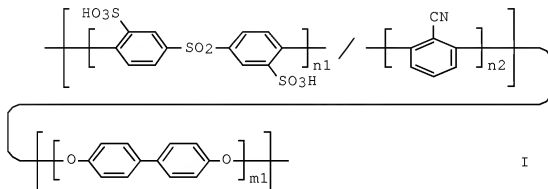
TI Polymer electrolyte membrane/catalyst assembly, its manufacture, and hydrogen-fueled fuel cell
 IN Yamashita, Masahiro; Kitamura, Kota; Yamaguchi, Hiroki; Yamada, Takatoshi; Shimizu, Yusuke; Miyagawa, Shinji
 PA Toyobo Co., Ltd., Japan; Nissan Motor Co., Ltd.
 SO Jpn. Kokai Tokkyo Koho, 16pp.

CODEN: JKXXAF

DT Patent
 LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2008166049	A	20080717	JP 2006-352389	20061227
PRAI	JP 2006-352389		20061227		
GI					



AB The polymer electrolyte membrane/catalyst assembly contains (1) a polymer electrolyte membrane which contains a polymer I ($n_1, n_2 = \geq 1$ -integer satisfying $n_1/(n_1 + n_2) = 0.40-0.70$; $m_1 = \geq 1$ -integer) and shows coefficient of linear expansion at $150-200^\circ$ (TGA, in N_3 , 30-min dry at 25° followed by heating at $5^\circ/\text{min}$ to 350°) in a predetd. range and (2) an electrode catalyst layer which is bonded directly on at least one side of the polymer electrolyte membrane and has been formed by direct application of a catalyst slurry containing Pt/C

powder, ionomers, and solvent in such a way that the surface roughness of the membrane/catalyst interface becomes $\leq 1 \mu\text{m}$.

IT 681035-31-4P, 4,4'-Biphenol-2,6-dichlorobenzonitrile-3,3'-disulfo-4,4'-dichlorodiphenylsulfone disodium salt copolymer
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

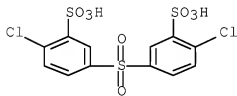
RN 681035-31-4 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol and 2,6-dichlorobenzonitrile (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 C12 O8 S3 . 2 Na



●2 Na

CM 2

CRN 1194-65-6

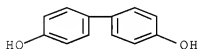
CMF C7 H3 Cl2 N



CM 3

CRN 92-88-6

CMF C12 H10 O2



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Carbon black, uses

RL: TEM (Technical or engineered material use); USES (Uses)
 (Vulcan XC 72R, gas diffusion layer; manufacture
 of polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)

IT 7440-06-4, Platinum, uses 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses)
 (Pt/carbon electrode catalyst layer
 ; manufacture of polymer electrolyte membrane/electrode assembly
 for
 hydrogen-fueled polymer electrolyte fuel cells)

IT 354114-33-3, TGP-H 060

RL: TEM (Technical or engineered material use); USES (Uses)
 (gas diffusion layer; manufacture of polymer
 electrolyte membrane/electrode assembly for hydrogen-fueled
 polymer electrolyte fuel cells)

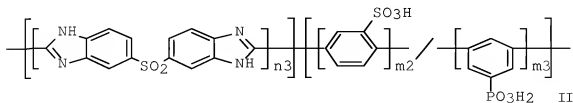
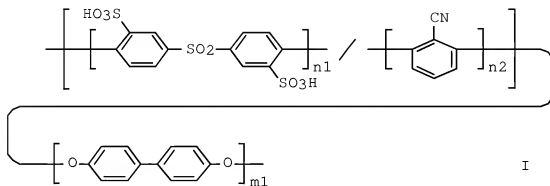
IT 681035-31-4P, 4,4'-Biphenol-2,6-dichlorobenzonitrile-3,3'-
 disulfo-4,4'-dichlorodiphenylsulfone disodium salt copolymer

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
 (Technical or engineered material use); PREP (Preparation); USES
 (Uses)
 (polymer electrolyte membrane/electrode assembly (MEA), its
 manufacture, and its hydrogen-fueled polymer electrolyte fuel
 cells)

III

L56 ANSWER 3 OF 5 HCAPLUS COPYRIGHT 2008 ACS on STN
 AN 2008:859823 HCAPLUS Full-text
 DN 149:180165
 TI Polymer electrolyte membrane/catalyst assembly, its manufacture, and
 hydrogen-fueled fuel cell
 IN Sakaguchi, Yoshimitsu; Kitamura, Kota; Yamaguchi, Hiroki; Yamashita,
 Masahiro; Yamada, Takatoshi; Takase, Satoshi; Miyagawa, Shinji
 PA Toyobo Co., Ltd., Japan; Nissan Motor Co., Ltd.
 SO Jpn. Kokai Tokkyo Koho, 15pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2008166037	A	20080717	JP 2006-352154	200612 27
PRAI	JP 2006-352154		20061227		
GI					



AB The polymer electrolyte membrane/catalyst assembly contains (1) a polymer electrolyte membrane which is composed of 85-95% of a polymer I ($n_1, n_2 = \geq 1$ -integer satisfying $n_1/(n_1 + n_2) = 0.40-0.70$; $m_1 = \geq 1$ -integer) and 5-15% of a polymer II ($n_3 = \geq 1$ -integer; $m_2, m_3 = \geq 1$ -integer satisfying $m_3/(m_2 + m_3) = 0.60-0.80$) and (2) an electrode catalyst layer which is bonded directly on at least one side of the polymer electrolyte membrane and has been formed by direct application of a catalyst slurry containing electrode catalysts, polymer electrolytes, and solvents in such a way that the surface roughness of the membrane/catalyst interface becomes $\leq 1 \mu\text{m}$.

IT 681035-31-4F, 4,4'-Biphenol-2,6-dichlorobenzonitrile-3,3'-disulfo-4,4'-dichlorodiphenylsulfone disodium salt copolymer
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel

cells)

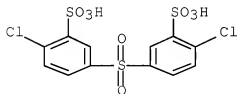
RN 681035-31-4 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol and 2,6-dichlorobenzonitrile (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 C12 O8 S3 . 2 Na



● 2 Na

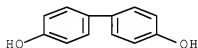
CM 2

CRN 1194-65-6
CMF C7 H3 Cl2 N



CM 3

CRN 92-88-6
CMF Cl2 H10 O2



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Carbon black, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(Vulcan XC 72R, gas diffusion layer; manufacture
of polymer electrolyte membrane/electrode assembly for
hydrogen-fueled polymer electrolyte fuel cells)
IT 7440-06-4, Platinum, uses 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(Pt/carbon electrode catalyst layer
; manufacture of polymer electrolyte membrane/electrode assembly
for
hydrogen-fueled polymer electrolyte fuel cells)
IT 354114-33-3, TGP-H 060
RL: TEM (Technical or engineered material use); USES (Uses)
(gas diffusion layer; manufacture of polymer
electrolyte membrane/electrode assembly for hydrogen-fueled
polymer electrolyte fuel cells)
IT 631035-31-4P, 4,4'-Biphenol-2,6-dichlorobenzonitrile-3,3'-
disulfo-4,4'-dichlorodiphenylsulfone disodium salt copolymer
861709-53-7P, 2,5-Dicarboxybenzenesulfonic acid monosodium

salt-3,5-dicarboxyphenylphosphonic acid-3,3',4,4'-tetraaminodiphenyl sulfone copolymer

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

L56 ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2008:859822 HCAPLUS Full-text

DN 149:157283

TI Polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells

IN Kitamura, Kota; Sakaguchi, Yoshimitsu; Yamaguchi, Hiroki; Yamashita, Masahiro; Yamada, Takatoshi; Takase, Satoshi; Miyagawa, Shinji

PA Toyobo Co., Ltd., Japan; Nissan Motor Co., Ltd.

SO Jpn. Kokai Tokkyo Koho, 14pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	JP 2008166036	A	20080717	JP 2006-352148	200612 27
PRAI	JP 2006-352148		20061227		
GI					

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB The MEA contains a polymer electrolyte membrane comprising a polymer represented by the general formula I [$n_1, n_2, m_1-m_3 = \geq 1$ -integer satisfying $n_1/(n_1 + n_2) = 0.40-0.70$, $m_3/(m_1 + m_2 + m_3) = 0.005-0.05$, and $m_2/(m_1 + m_2 + m_3) = 0.01-0.20$] and an electrode catalyst layer which is bonded directly at least on one side of the polymer electrolyte membrane, where the surface roughness of the membrane/catalyst interface is $\leq 1 \mu\text{m}$. The MEA is prepared by direct application of a catalyst slurry containing an electrode catalyst, a polymer electrolyte and a solvent at least on one side of the polymer electrolyte membrane of a polymer I in such a way that the surface roughness of the membrane/catalyst interface becomes $\leq 1 \mu\text{m}$. The

hydrogen-fueled polymer electrolyte fuel cell shows high output performance even in low moisturizing condition and also shows excellent durability.

IT 916849-47-3P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(manufacture of polymer electrolyte membrane/electrode assembly

for

hydrogen-fueled polymer electrolyte fuel cells)

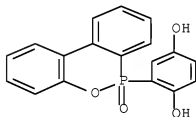
RN 916849-47-3 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 99208-50-1

CMF C18 H13 O4 P

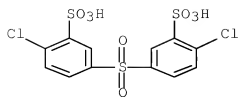


CM 2

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

10/714,394

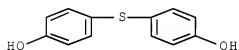


● 2 Na

CM 3

CRN 2664-63-3

CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

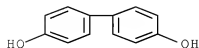
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

CMF C12 H10 O2



CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT Carbon black, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (Vulcan XC 72R, gas diffusion layer; manufacture
 of polymer electrolyte membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte fuel cells)
 IT 354114-33-3, TGP-H 060
 RL: TEM (Technical or engineered material use); USES (Uses)
 (gas diffusion layer; manufacture of polymer
 electrolyte membrane/electrode assembly for hydrogen-fueled
 polymer electrolyte fuel cells)
 IT 916849-47-3P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (manufacture of polymer electrolyte membrane/electrode assembly
 for
 hydrogen-fueled polymer electrolyte fuel cells)
 IT 7440-06-4, Platinum, uses 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (platinum/carbon electrode catalyst
 layer; manufacture of polymer electrolyte membrane/electrode
 assembly for hydrogen-fueled polymer electrolyte fuel cells)

L56 ANSWER 5 OF 5 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2006:117649 HCAPLUS [Full-text](#)

DN 144:195256

TI Polymer electrolyte fuel cell

IN Saito, Shin; Iwasaki, Katsuhiko

PA Sumitomo Chemical Co., Ltd., Japan

SO Can. Pat. Appl., 41 pp.

CODEN: CFPXXE

DT Patent

LA English

FAN.CNT 1

PATENT NO.

KIND

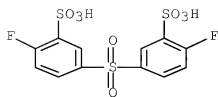
DATE

APPLICATION NO.

DATE

PI	CA 2513518	A1	20060130	CA 2005-2513518	200507 26
	EP 1626453	A2	20060215	EP 2005-106807	200507 25
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
	JP 2006066391	A	20060309	JP 2005-217020	200507 27
	US 20060280999	A1	20061214	US 2005-189723	200507 27
	KR 2006048879	A	20060518	KR 2005-69036	200507 28
PRAI	JP 2004-223434	A	20040730		
AB	The invention concerns a polymer electrolyte fuel cell comprising: a solid polymer electrolyte membrane containing an aromatic polymer electrolyte; an electrode comprising a catalyst layer and a gas diffusion layer as an anode and a cathode to be joined on both surfaces of this solid polymer electrolyte membrane; a gas sealing material to be disposed in a periphery of the gas diffusion layer; and a separator having a reaction gas flow field; wherein the gas diffusion layer surrounds the whole outer edge of the gas flow field of the separator and has a larger area than an area occupied by the outer edge of the gas flowfield of the separator is provided.				
IT	875098-09-2P RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses) (polymer electrolyte fuel cell)				
RN	875098-09-2 HCAPLUS				
CN	Benzenesulfonic acid, 3,3'-sulfonylbis[6-fluoro-, dipotassium salt, polymer with 2,5-dihydroxybenzenesulfonic acid, 1,1'-sulfonylbis[4-fluorobenzene] and 4,4'-sulfonylbis[phenol] (9CI) (CA INDEX NAME)				
CM	1				
CRN	816417-98-8				
CMF	C12 H8 F2 O8 S3 . 2 K				

10/714,394

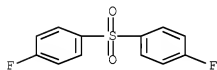


● 2 K

CM 2

CRN 383-29-9

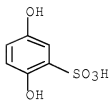
CMF C12 H8 F2 O2 S



CM 3

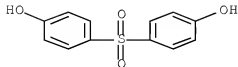
CRN 88-46-0

CMF C6 H6 O5 S



CM 4

CRN 80-09-1
CMF C12 H10 O4 S



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
IT 24938-68-9P ~~875098-09-2P~~
RL: DEV (Device component use); SPN (Synthetic preparation); PREP
(Preparation); USES (Uses)
(polymer electrolyte fuel cell)

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